



SPP *Southwest Power Pool*

*System Impact Study
SPP-2003-271-1
For Transmission Service
Requested By
InterGen Services, Inc.*

From OKGE To OKGE

*For a Reserved Amount Of 1200 MW
From 5/1/04
To 5/1/07*

SPP Tariff Studies

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ATTACHMENT: *SPP-2003-271-1 Tables*

1. Executive Summary

InterGen Services, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from OKGE to OKGE. The period of the service is from 5/1/04 to 5/1/07. The request is for OASIS reservations 619539 - 619544 for a total amount of 1200 MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 1200 MW request while maintaining system reliability. Analysis was conducted for the requested service period above and for the remaining planning horizon from 5/1/07 to 4/1/11. The additional evaluation of the planning horizon was conducted to determine any future constraints that may limit the renewal of service.

The OKGE to OKGE 1200 MW request was studied using three System Scenarios. The studied transfers cause new facility overloads on the SPP and Non-SPP transmission system, as well as increasing the loading on previously overloaded facilities. Tables 1, 2, 3, 4 and 5 summarize the results of the system impact analyses. Table 1 lists SPP facility overloads identified, excluding OKGE facilities, using Scenario 1. Table 2 lists Non-SPP facility overloads identified using Scenario 1. Table 3 lists OKGE facility overloads identified using Scenario 1. Tables 4 and 5 list the OKGE facility overloads identified using Scenario 2 and 3, respectively. For Scenarios 2 and 3, only OKGE facility overloads were determined.

The study results of the OKGE to OKGE requests show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to the status of five higher priority requests. The five higher priority requests are a SPS to MPS 200 MW Redirect, a SPS to CSWS 13 MW Original, a SPS to EDDY 67 MW Original, and two EDE to EDE 250 MW Originals. These requests were not modeled in the study cases.

SPP will also review the possibility of curtailment of previously confirmed service and/or the redispatch of units as an option for relieving the additional impacts on the SPP facilities caused by the OKGE to OKGE requests. These options will be evaluated as part of the Facility Study. Execution of a Facility Study Agreement is now required to maintain queue position. The final ATC, upgrade solutions, cost assignments, complete evaluation of renewal rights, and available redispatch and curtailment options will be determined upon the completion of the facility study.

2. Introduction

InterGen Services, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from OKGE to OKGE for 1200 MW. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the requested service.

The OKGE to OKGE 1200 MW transfer was studied using three System Scenarios. The service was modeled by six increments of 200 MW from a source in OKGE to marginally dispatched OKGE units. The three scenarios were studied to capture worst case system limitations dependent on the bias of the transmission system.

This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses. The steady-state analyses consider the impact of the 1200 MW transfer on transmission line loading and transmission bus voltages for system intact and system outages of single and selected multiple transmission lines and transformers on the SPP systems and first tier Non - SPP systems.

3. Study Methodology

A. Description

The system impact analysis was conducted to determine the steady-state impact of the 1200 MW transfer on the SPP and first tier Non - SPP systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency.

The contingency set includes all SPP facilities 69kV and above, SPP First Tier facilities 115 kV and above, and any defined contingencies for these areas. The monitor elements include all SPP and first tier Non-SPP facilities 69 kV and above.

B. Model Updates

SPP used fifteen seasonal models to study the OKGE to OKGE 1200 MW transfer for the requested service period and the remaining planning horizon. The SPP 2004 Series Cases 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Summer Shoulder (04SH), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), 2005/06 Winter Peak (05WP), 2007 Summer Peak (07SP), and 2007/08 Winter Peak (07WP) were used to study the impact of the 1200 MW transfer on the system during the requested service period of 5/1/04 to 5/1/07. The SPP 2004 Series 2010 Summer Peak (10SP), and 2010/11 Winter Peak (10WP) were used to study the impact of the 1200 MW transfer on the system during the remaining planning horizon from 5/1/07 to 4/1/11.

The chosen base case models were modified to reflect the most current modeling information. From the fifteen seasonal models, three system scenarios were developed. Scenario 1 includes SWPP OASIS transmission requests not already included in the SPP 2004 Series Cases flowing in a West to East direction with ERCOT exporting and the Southwestern Public Service (SPS) Control Area exporting to outside control areas and exporting to the planned Lamar HVDC Tie. Scenario 2 includes transmission requests not already included in the SPP 2004 Series Cases flowing in an East to West direction with ERCOT importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The third scenario includes SWPP OASIS transmission requests not already included in the SPP 2004 Series Cases flowing in a West to East direction with ERCOT importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The system scenarios were developed to minimize counter flows to the transfers studied.

C. Transfer Analysis

Four different transfer analyses were performed. The first transfer analysis was performed on Scenario 1 using the entire contingency set and monitored list. The analysis provides the impact of the full 1200 MW transfer on SPP and Non-SPP facilities. The other three transfer analyses were performed to more thoroughly determine the impact of the full 1200 MW transfer in increments of 200 MW on the OKGE system using all three developed scenarios. Using the selected cases both with and without the respective transfer increments modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or

impacted by the transfers. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

D. Upgrade Analysis

This system impact study does not include analysis with the assigned upgrades modeled. To determine the final cost and possible start date of the requested service, additional analysis will be performed to determine the impact of modeling the assigned upgrades for the OKGE to OKGE requests.

4. Study Results

A. Study Analysis Results

Tables 1, 2, 3, 4, and 5 contain the steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2003-271-1 Tables*. The tables identify the seasonal case in which the event occurred, the facility control area location, applicable ratings of the overloaded facility, the loading percentage with and without the 1200 MW transfer, and the estimated ATC value if calculated. Comments are provided in the tables to document any SPP or Non - SPP identification or assignment of the event, existing mitigations plans or criteria to disregard the event as a limiting constraint, upgrades and costs to mitigate a limiting constraint, or any specific study procedures associated with modeling an event. The estimated ATC was calculated by interpolation between 0 MW and 1200 MW for Table 1 and between the six incremental steps of 200 MW for Tables 3, 4, and 5.

Table 1 lists the SPP Facility Overloads excluding OKGE facilities, caused or impacted by the 1200 MW transfer, using Scenario 1. Solutions with engineering and construction costs are provided in the tables.

Tables 2 lists overloads on first tier Non - SPP Regional Tariff participants' transmission systems caused or impacted by the 1200 MW transfer, using Scenario 1. Comments are provided in the tables.

Tables 3, 4, and 5 list the OKGE Facility Overloads caused or impacted by the 1200 MW transfer with ATC determined by interpolating between the six incremental steps of 200 MW, using Scenario 1, 2, and 3 respectively. The highlighted ATC values in each Table represent the worst case System Scenario for the OKGE limitations identified.

Tables 1a, 3a, 4a, and 5a document the modeling representation of the events identified in Tables 1, 3, 4, and 5 respectively to include bus numbers and bus names.

5. Conclusion

The study results of the OKGE to OKGE requests show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. Any solutions, upgrades, and costs provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to the status of five higher priority requests. The five higher priority requests are a SPS to MPS 200 MW Redirect, a SPS to CSWS 13 MW Original, a SPS to EDDY 67 MW Original, and two EDE to EDE 250 MW Originals. These requests were not modeled in the study cases.

SPP will also review the possibility of curtailment of previously confirmed service and/or the redispatch of units as an option for relieving the additional impacts on the SPP facilities caused by the OKGE to OKGE requests. These options will be evaluated as part of the Facility Study. Execution of a Facility Study Agreement is now required to maintain queue position. The final ATC, upgrade solutions, cost assignments, complete evaluation of renewal rights, and available redispatch and curtailment options will be determined upon the completion of the facility study.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply immediately
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

ACCC CASES:

Solutions – AC contingency checking (ACCC)

1. MW mismatch tolerance – 0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excl'd cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

Newton Solution:

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits - Apply automatically
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	WERE	WERE	ATHENS SWITCHING STATION - COFFEY COUNTY NO. 4 VERNON 69KV	45	104.5	105.8	LACYGNE - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	118.5	118.8	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	102.7	102.9	IATAN - ST JOE 345KV	0	Rebuild 15.50-mile line (1192.5 kmii 45/7 ACSR, 223 MVA, 245 MVA), Replace CTs and Wave Trap (2000 A.)	\$ 5,800,000
04G	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	100.7	100.8	CONCORDIA - EAST MANHATTAN 230KV	0	See Previous Upgrade Specified	
04G	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	100.7	100.8	CONCORDIA 230/115KV TRANSFORMER	0	See Previous Upgrade Specified	
04G	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	113.5	113.8	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	105.7	107.0	LACYGNE - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	100.5	101.1	ROSE HILL - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	100.3	100.7	BENTON - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	111.4	111.7	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04SP	GRRD	GRRD	BRISTOW - KELLYVILLE 69KV	51	119.8	120.5	MANFORD - SILVER CITY 69KV	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
04SP	SWPA	ENTR	BULL SHOALS - MIDWAY 161KV	162	102.0	102.3	INDEPENDENCE - MOOREFIELD 161KV	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals.	\$ 150,000
04SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	112.2	112.6	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	109.7	110.1	CARTHAGE - JASPER 69KV	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	106.1	106.4	SUB 382 - LARUSSEL - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	104.4	104.8	JASPER - LAMAR 69KV	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	101.9	102.2	SUB 124 - AURORA H.T. - SUB 355 - AURORA WEST 69KV	0	AECI third party line. No SWPA upgrades required.	
04SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	335	102.9	103.1	DYESS - SOUTH SPRINGDALE 161KV	0	Replace Farmington switch 8839	\$ 60,000
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	132.4	133.2	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetraps & reset relays.	\$ 7,200,000
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	122.3	122.8	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	118.7	119.5	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	100.2	100.9	FLINT CREEK - GENTRY REC 161KV	0	See Previous Upgrade Specified	
04SP	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	106.6	106.7	CLAREMORE 161/69KV TRANSFORMER CKT 2	0	Add 3rd 161/69 KV Transformer	\$ 1,250,000
04SP	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	106.9	107.0	CLAREMORE 161/69KV TRANSFORMER CKT 1	0	See Previous Upgrade Specified	
04SP	OMPW	AEPW	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	105.7	106.7	CORNVILLE - RUSH SPRINGS NATURAL GAS TAP 138KV	0	Rebuild 17.81 miles of 266 ACSR with 795 ACSR	\$ 6,100,000
04SP	AEPW	AEPW	DYESS - SOUTH SPRINGDALE 161KV	313	100.9	101.0	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	Replace South Springdale Circuit Switcher & Jumpers	\$ 60,000
04SP	GRDA	GRDA	KINZIE 138/69KV TRANSFORMER	56	112.2	112.4	CENTRAL - STILLWATER 69KV	0	Solution Undetermined	
04SP	GRDA	GRDA	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	78	107.6	108.9	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	0	Add 3rd 161/69 KV Transformer	\$ 1,400,000
04SP	GRDA	GRDA	TAHLEQUAH 161/69KV TRANSFORMER CKT 2	78	109.1	109.5	TAHLEQUAH 161/69KV TRANSFORMER CKT 1	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	EAST CENTRAL HENRYETTA - OKMULGEE 138KV	105	92.8	105.1	KELCO - OKMULGEE 138KV	705	Replace Okmulgee Wavetraps	\$ 40,000
04SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	99.4	100.1	EAST CENTERTON - GENTRY REC 161KV	1035	See Previous Upgrade Specified	
04SP	AEPW	AEPW	EAST CENTRAL HENRYETTA - WEELETKA 138KV	105	88.6	100.9	KELCO - OKMULGEE 138KV	1115	Replace Weleetka Wavetraps	\$ 40,000
04SP	AEPW	AEPW	ATOKA - ATOKA PUMP 69KV	39	117.0	117.1	LONE OAK - SOUTH MCALESTER TAP 138KV	1200	Invalid Contingency	
04SP	AEPW	AEPW	MCALESTER - WEELETKA 69KV	52	120.0	120.4	LONE OAK - SOUTH MCALESTER TAP 138KV	1200	Invalid Contingency	
04SP	SWPA	SWPA	SPRINGFIELD 161/69KV TRANSFORMER CKT 3	25	100.2	100.5	SPRINGFIELD 161/69KV TRANSFORMER CKT 1	1200	An outage of Springfield transformer #1 overloads transformer #3. If this situation were to occur, SWPA would open either the high or low side breaker on transformer #3 to remove the overload. This does not introduce any other overloads.	
04SH	WERE	WERE	ANZIO - FORT JCT SWITCHING STATION 115KV	92	100.2	100.4	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	0	Solution Undetermined	
04SH	WERE	WERE	ANZIO - FORT JCT SWITCHING STATION 115KV	92	100.1	100.3	Multiple Outage Contingency: FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1 FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
04SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	106.0	106.2	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
04SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	103.5	103.7	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
04SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	109.0	109.7	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
04SH	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	100.4	100.9	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
04SH	GRDA	GRDA	KINZIE 138/69KV TRANSFORMER	56	108.9	109.1	CENTRAL - STILLWATER 69KV	0	Solution Undetermined	
04SH	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	102.7	102.9	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	1200	Invalid Contingency	
04FA	WERE	WERE	ATHENS SWITCHING STATION - COFFEY COUNTY NO. 4 VERNON 69KV	45	107.6	107.8	LACYGNE - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	117.4	117.7	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04FA	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	112.3	112.6	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	

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 Table 1 - SPP Facility Overloads Caused or Impacted
 by 1200 MW Transfer using Scenario 1
 Excludes OKGE Facilities

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04FA	WERE	WERE	COFFEY COUNTY NO. 4 VERNON - GREEN 69KV	45	108.9	109.1	LACYGNE - WOLF CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	110.2	110.5	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	124.5	124.7	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	105.5	105.7	IATAN - ST JOE 345KV	0	See Previous Upgrade Specified	
04WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	101.0	101.2	CONCORDIA - EAST MANHATTAN 230KV	0	See Previous Upgrade Specified	
04WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	101.0	101.2	CONCORDIA 230/115KV TRANSFORMER	0	See Previous Upgrade Specified	
04WP	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	121.2	121.5	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	101.2	101.5	IATAN - ST JOE 345KV	0	Rebuild 15.15 mile line with 1192.5 kcmil ACSR.	\$ 3,200,000
04WP	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	119.4	119.6	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	SWPA	SWPA	NORFORK 161/69KV TRANSFORMER CKT 1	25	109.8	109.9	NORFORK 161/69KV TRANSFORMER CKT 2	0	Replace Norfolk Transformer	\$ 1,300,000
04WP	SWPA	SWPA	NORFORK 161/69KV TRANSFORMER CKT 1	25	109.0	109.1	NORFORK 161/69KV TRANSFORMER CKT 2	0	See Previous Upgrade Specified	
04WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	100.5	100.8	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	Tear down double circuit, build single circuit with 1192.5 ACSR.	\$ 7,800,000
04WP	WERE	WERE	EL PASO - GILL ENERGY CENTER SOUTH 138KV	210	108.6	108.8	EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV	1200	Invalid Contingency	
05AP	AEPW	CELE	INTERNATIONAL PAPER - WALLACE LAKE 138KV	236	100.3	101.6	DOLET HILLS 345/230KV TRANSFORMER	0	May be relieved by Dolet Hills Operating Guide	
05AP	AEPW	AEPW	SOUTH SHREVEPORT - WALLACE LAKE 138KV	210	103.6	104.9	DOLET HILLS 345/230KV TRANSFORMER	0	May be relieved by Dolet Hills Operating Guide	
05G	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	118.4	118.5	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	113.1	113.2	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	110.9	111.0	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	NORTH AMERICAN PHILIPS - NORTH AMERICAN PHILIPS JCT (SOUTH) 115KV	160	101.4	101.6	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	\$ 417,200
05G	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	109.5	109.7	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05G	WERE	WERE	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	141	100.0	100.1	JEFFREY ENERGY CENTER - SUMMIT 345KV	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05G	WERE	WERE	EL PASO - GILL ENERGY CENTER SOUTH 138KV	210	125.1	125.3	EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV	1200	Invalid Contingency	
05G	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	104.8	104.9	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	1200	Invalid Contingency	
05SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	152.7	152.8	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	147.8	148.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	133.5	133.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	129.3	129.4	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	112.7	113.1	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	108.9	109.3	CARTHAGE - JASPER 69KV	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	107.3	107.6	SUB 382 - LARUSSEL - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	103.7	104.0	JASPER - LAMAR 69KV	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	101.9	102.2	SUB 124 - AURORA H.T. - SUB 355 - AURORA WEST 69KV	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	101.3	101.4	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
05SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	100.3	100.4	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
05SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	101.4	101.5	DYESS - SOUTH SPRINGDALE 161KV	0	Rebuild 10.24 miles with 2156 ACSR, replace Chamber Springs wavetrap, & replace Farmington AECC bus.	\$ 6,400,000
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	138.0	138.8	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	127.2	127.8	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	123.6	124.5	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	104.7	105.3	FLINT CREEK - GENTRY REC 161KV	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	103.9	104.5	EAST CENTERTON - GENTRY REC 161KV	0	See Previous Upgrade Specified	
05SP	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	107.0	107.1	CLAREMORE 161/69KV TRANSFORMER CKT 2	0	See Previous Upgrade Specified	
05SP	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	107.3	107.4	CLAREMORE 161/69KV TRANSFORMER CKT 1	0	See Previous Upgrade Specified	
05SP	OMPA	AEPW	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	109.8	110.6	CORNVILLE - RUSH SPRINGS NATURAL GAS TAP 138KV	0	See Previous Upgrade Specified	
05SP	OMPA	AEPW	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	100.2	101.0	RUSH SPRINGS NATURAL GAS TAP - RUSH SPRINGS TAP 138KV	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	DYESS - SOUTH SPRINGDALE 161KV	313	104.8	104.9	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
05SP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	108.5	108.6	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	101.7	101.8	LOWELL - TONTITOWN 161KV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	\$ 450,000
05SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	144.0	144.1	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	139.3	139.5	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	

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 Table 1 - SPP Facility Overloads Caused or Impacted
 by 1200 MW Transfer using Scenario 1
 Excludes OKGE Facilities

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	126.0	126.1	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	121.9	122.1	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	GRDA	GRDA	KINZIE 138/69KV TRANSFORMER	56	116.4	116.6	CENTRAL - STILLWATER 69KV	0	Solution Undetermined	
05SP	WERE	WERE	LAWRENCE HILL 230/115KV TRANSFORMER	308	107.2	107.3	LAWRENCE HILL - MIDLAND JCT 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland JCT 230kV Line	
05SP	WERE	WERE	LAWRENCE HILL 230/115KV TRANSFORMER	308	105.2	105.3	LAWRENCE HILL - MIDLAND JCT 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland JCT 230kV Line	
05SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	129.9	130.1	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	125.8	126.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	113.5	113.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	109.8	110.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	132.2	132.3	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	128.1	128.2	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	115.5	115.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	111.8	112.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	AEPW	AEPW	BLUE CIRCLE - CATOOSA 69KV	72	101.9	102.2	LYNN LANE TAP - LYNN LANE WEST TAP 138KV	1200	Invalid Contingency	
05SP	AEPW	AEPW	MCALISTER - WEELETKA 69KV	52	127.0	127.4	LONE OAK - SOUTH MCALISTER TAP 138KV	1200	Invalid Contingency	
05SH	WERE	WERE	ANZIO - FORT JCT SWITCHING STATION 115KV	92	103.0	103.2	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	0	Solution Undetermined	
05SH	WERE	WERE	ANZIO - FORT JCT SWITCHING STATION 115KV	92	103.0	103.2	Multiple Outage Contingency: FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1 FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
05SH	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	147.8	147.9	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	129.2	129.4	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	110.4	110.7	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
05SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	107.5	107.7	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
05SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	109.8	110.0	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECI.	
05SH	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	106.7	106.9	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECI.	
05SH	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	115.6	116.3	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
05SH	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	106.6	107.1	FLINT CREEK - TONITOWN 161KV	0	See Previous Upgrade Specified	
05SH	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	103.9	104.7	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
05SH	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 1	84	100.2	100.4	CLAREMORE 161/69KV TRANSFORMER CKT 2	0	See Previous Upgrade Specified	
05SH	GRDA	GRDA	CLAREMORE 161/69KV TRANSFORMER CKT 2	84	100.5	100.7	CLAREMORE 161/69KV TRANSFORMER CKT 1	0	See Previous Upgrade Specified	
05SH	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	109.0	109.2	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05SH	WERE	WERE	EXIDE JCT - SUMMIT 115KV	196	105.5	105.6	NORTHVIEW - SUMMIT 115KV	0	Rebuild and reconductor 4.94 miles with 1192 ACSR.	\$ 1,100,000
05SH	WERE	WERE	EXIDE JCT - SUMMIT 115KV	196	101.0	101.2	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05SH	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	140.7	140.8	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	123.1	123.3	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	129.5	129.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	113.1	113.2	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	131.3	131.5	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	

Table 1 - SPP Facility Overloads Caused or Impacted
by 1200 MW Transfer using Scenario 1
Excludes OKGE Facilities

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SH	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	114.7	114.8	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	TECUMSEH HILL 161/115KV TRANSFORMER	69	100.2	100.3	HOYT - HOYT HTI SWITCHING JCT 115KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 632 Overload of the Tecumseh Hill 161/115kV Transformer	
05SH	WERE	WERE	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	141	100.9	101.1	JEFFREY ENERGY CENTER - SUMMIT 345KV	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05SH	WERE	WERE	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	141	100.7	100.9	SUMMIT 345/230KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05SH	AEPW	AEPW	EAST CENTRAL HENRYETTA - OKMULGEE 138KV	105	87.9	105.1	KELCO - OKMULGEE 138KV	845	See Previous Upgrade Specified	
05SH	AEPW	AEPW	EAST CENTRAL HENRYETTA - WEELETKA 138KV	105	84.1	101.4	KELCO - OKMULGEE 138KV	1106	See Previous Upgrade Specified	
05SH	SWPA	AECI	DONIPHAN 161/69KV TRANSFORMER CKT 1	18.75	151.5	151.7	DONIPHAN 161/69KV TRANSFORMER CKT 2	1200	Local area problem. Transformer is owned by AECI.	
05SH	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	104.3	104.5	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	1200	Invalid Contingency	
05FA	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	137.3	137.5	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	125.6	125.8	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	120.0	120.2	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	109.9	110.0	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	GRRD	GRRD	BRISTOW - KELLYVILLE 69KV	51	101.2	101.4	MANFORD - SILVER CITY 69KV	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
05FA	EMDE	SWPA	CARTHAGE - SUB 109 - ATLAS JCT. 161KV	167	112.0	112.4	SUB 292 - TIPTON FORD - SUB 389 - JOPLIN SOUTHWEST 161KV	0	Replace 600 Amp disconnect switches	\$ 60,000
05FA	EMDE	SWPA	CARTHAGE - SUB 109 - ATLAS JCT. 161KV	167	102.0	102.3	SUB 349 - ASBURY - SUB 421 - PURCELL SOUTHWEST 161KV	0	See Previous Upgrade Specified	
05FA	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	100.9	101.1	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
05FA	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	100.2	100.4	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECI.	
05FA	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	111.8	112.0	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	106.2	106.4	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	100.6	100.8	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05FA	WERE	WERE	EXIDE JCT - NORTH AMERICAN PHILIPS 115KV	196	102.3	102.5	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	Rebuild and reconductor 0.34 miles with 1192 ACSR.	\$ 95,200
05FA	WERE	WERE	EXIDE JCT - SUMMIT 115KV	196	107.5	107.7	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	EXIDE JCT - SUMMIT 115KV	196	101.2	101.3	NORTHVIEW - SUMMIT 115KV	0	See Previous Upgrade Specified	
05FA	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	100.5	100.7	JEFFREY ENERGY CENTER - SUMMIT 345KV	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05FA	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	100.2	100.4	SUMMIT 345/230KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05FA	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	131.5	131.7	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	119.8	119.9	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	115.1	115.3	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	104.8	104.9	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	104.1	104.3	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	122.4	122.6	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	110.5	110.7	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	106.9	107.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	NORTH AMERICAN PHILIPS - NORTH AMERICAN PHILIPS JCT (SOUTH) 115KV	160	113.5	114.0	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	122.5	123.0	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 2	92	106.9	107.3	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	124.1	124.2	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	112.2	112.3	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	

Table 1 - SPP Facility Overloads Caused or Impacted
by 1200 MW Transfer using Scenario 1
Excludes OKGE Facilities

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05FA	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	108.3	108.5	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	EMDE	EMDE	SUB 110 - ORONOJO JCT. - SUB 432 - JOPLIN OAKLAND NORTH 161KV	214	101.3	101.6	SUB 292 - TIPTON FORD - SUB 389 - JOPLIN SOUTHWEST 161KV	0	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR.	\$ 800,000
05FA	WERE	WERE	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	141	105.9	106.1	JEFFREY ENERGY CENTER - SUMMIT 345KV	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05FA	WERE	WERE	WEST JCT CITY - WEST JCT CITY JCT (EAST) 115KV	141	105.5	105.7	SUMMIT 345/230KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05FA	EMDE	SWPA	CARTHAGE - SUB 109 - ATLAS JCT. 161KV	167	99.8	100.2	SUB 395 - CARTHAGE SOUTHWEST - SUB 421 - PURCELL SOUTHWEST 161KV	722	See Previous Upgrade Specified	
05FA	WERE	WERE	EL PASO - GILL ENERGY CENTER SOUTH 138KV	210	115.5	115.7	EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV	1200	Invalid Contingency	
05WP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	110.3	110.4	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05WP	GRRD	GRRD	BRISTOW - KELLYVILLE 69KV	51	100.3	100.5	MANFORD - SILVER CITY 69KV	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
05WP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	275	103.1	103.6	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
05WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	112.3	112.5	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	108.1	108.4	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	AEPW	AEPW	JERICHO 115/69KV TRANSFORMER	46	107.3	108.1	AMOCO TAP - CHILDRESS 69KV CKT 1	0	Solution Undetermined	
05WP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	105.3	105.4	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05WP	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	106.2	106.5	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	SWPA	SWPA	NORFORK 161/69KV TRANSFORMER CKT 1	25	110.3	110.4	NORFORK 161/69KV TRANSFORMER CKT 2	0	See Previous Upgrade Specified	
05WP	WERE	WERE	NORTH AMERICAN PHILIPS - NORTH AMERICAN PHILIPS JCT (SOUTH) 115KV	160	105.5	106.0	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	113.8	114.4	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	EL PASO - GILL ENERGY CENTER SOUTH 138KV	210	103.4	103.6	EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV	1200	Invalid Contingency	
05WP	AEPW	AEPW	JERICHO 115/69KV TRANSFORMER	46	107.3	108.0	CHILDRESS 138/69KV TRANSFORMER CKT 1	1200	Invalid Contingency	
07SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	172.2	172.3	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	155.1	155.3	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	150.6	150.7	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	135.6	135.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	GRRD	GRRD	BRISTOW - KELLYVILLE 69KV	51	131.2	131.5	MANFORD - SILVER CITY 69KV	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
07SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	113.4	113.7	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	109.5	109.8	SUB 382 - LARUSSEL - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	108.7	109.0	CARTHAGE - JASPER 69KV	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	103.1	103.4	JASPER - LAMAR 69KV	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	102.2	102.4	SUB 124 - AURORA H.T. - SUB 355 - AURORA WEST 69KV	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	106.2	106.4	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	104.7	104.9	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	105.6	105.7	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	104.1	104.2	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECI.	
07SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	108.8	108.9	DYESS - SOUTH SPRINGDALE 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	101.2	101.6	CHAMBER SPRINGS - TONITOWN 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	145.8	146.7	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	133.8	134.3	FLINT CREEK - TONITOWN 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	130.1	130.9	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	110.1	110.8	FLINT CREEK - GENTRY REC 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	CHAMBER SPRINGS - TONITOWN 161KV	244	109.1	109.8	EAST CENTERTON - GENTRY REC 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	OMPA	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	112.5	113.4	CORNVILLE - RUSH SPRINGS NATURAL GAS TAP 138KV	0	See Previous Upgrade Specified	
07SP	AEPW	OMPA	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	102.9	103.8	RUSH SPRINGS NATURAL GAS TAP - RUSH SPRINGS TAP 138KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	DYESS - SOUTH SPRINGDALE 161KV	313	113.0	113.1	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	103.0	103.1	LOWELL - TONITOWN 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	100.5	100.6	LOWELL - ROGERS 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	105.7	105.8	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
07SP	AEPW	AEPW	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	313	100.3	100.4	DYESS - SOUTH SPRINGDALE 161KV	0	May Limit Renewal Rights	
07SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	105.9	106.0	LOWELL - TONITOWN 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	103.4	103.5	LOWELL - ROGERS 161KV	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	102.2	102.3	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	

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 Table 1 - SPP Facility Overloads Caused or Impacted
 by 1200 MW Transfer using Scenario 1
 Excludes OKGE Facilities

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	162.5	162.7	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	145.8	146.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	142.3	142.4	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	127.6	127.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	GRDA	GRDA	KINZIE 138/69KV TRANSFORMER	56	126.3	126.5	CENTRAL - STILLWATER 69KV	0	Solution Undetermined	
07SP	SPS	SPS	KRESS INTERCHANGE 115/69KV TRANSFORMER CKT 1	44	153.6	153.8	KRESS INTERCHANGE 115/69KV TRANSFORMER CKT 2	0	May be relieved due to Xcel Energy Transmission Operating Directive for Loss of the Kress 115/69 kV autotransformer	
07SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	147.1	147.2	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	131.2	131.5	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	128.5	128.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	114.6	114.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	AEPW	AEPW	SNYDER - TIPTON & HEADERICK 69KV	53	101.4	101.9	HOBART JCT - TAMARAC TAP 138KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV	68	149.5	149.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	133.5	133.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	130.6	130.7	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	116.6	116.9	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	AEPW	AEPW	BLUE CIRCLE - CATOOSA 69KV	72	104.8	105.0	LYNN LANE TAP - LYNN LANE WEST TAP 138KV	1200	Invalid Contingency	
07SP	AEPW	AEPW	MCALISTER - WEELETKA 69KV	52	134.2	134.5	LONE OAK - SOUTH MCALISTER TAP 138KV	1200	Invalid Contingency	
07WP	SWPA	AECI	CARTHAGE - REEDS 69KV	43	104.8	105.2	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
07WP	SWPA	AECI	CARTHAGE - REEDS 69KV	43	100.3	100.6	CARTHAGE - JASPER 69KV	0	AECI third party line. No SWPA upgrades required.	
07WP	AEPW	AEPW	CHAMBER SPRINGS - TONTTOWN 161KV	275	106.3	107.0	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
07WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	108.5	108.6	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	102.7	102.8	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	100.6	100.7	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	NORTH AMERICAN PHILIPS - NORTH AMERICAN PHILIPS JCT (SOUTH) 115KV	160	111.3	111.8	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	120.1	120.7	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 2	92	104.8	105.3	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	99.9	100.1	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	446	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
07WP	WERE	WERE	EL PASO - GILL ENERGY CENTER SOUTH 138KV	210	105.6	105.9	EVANS ENERGY CENTER NORTH - EVANS ENERGY CENTER SOUTH 138KV	1200	Invalid Contingency	
10SP	AEPW	AEPW	ANTLERS TAP - VALLEY TIMBER 69KV	48	101.2	101.7	ALLEN NATURAL GAS TAP - TUPELO 138KV	0	Possible Invalid Contingency	
10SP	AEPW	AEPW	ATOKA 138/69KV TRANSFORMER	36	105.7	105.8	ALLEN NATURAL GAS TAP - TUPELO 138KV	0	Possible Invalid Contingency	
10SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	221.6	221.8	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 1	68	180.6	180.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	193.8	193.9	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	AUBURN ROAD - KEENE 115KV CKT 2	92	157.9	158.1	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	GRRD	GRRD	BRISTOW - KELLYVILLE 69KV	51	145.2	145.4	MANFORD - SILVER CITY 69KV	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
10SP	SWPA	SPRM	BROOKLINE - SPRINGFIELD 161KV	323	103.9	104.0	BROOKLINE - JCT 161KV	0	May Limit Renewal Rights	
10SP	SWPA	AECI	CARTHAGE - JASPER 69KV	47	105.0	105.1	2MILO - 2CLARK 69KV CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	118.0	118.4	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	115.1	115.3	SUB 382 - LARUSSEL - SUB 383 - MONETT 161KV	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	112.8	113.1	CARTHAGE - JASPER 69KV	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	106.8	107.1	JASPER - LAMAR 69KV	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	CARTHAGE - REEDS 69KV	36	106.3	106.5	SUB 124 - AURORA H.T. - SUB 355 - AURORA WEST 69KV	0	AECI third party line. No SWPA upgrades required.	

SPP-2003-271-1
 Table 1 - SPP Facility Overloads Caused or Impacted
 by 1200 MW Transfer using Scenario 1
 Excludes OKGE Facilities

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	111.3	111.5	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECL	
10SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 1	84	109.9	110.1	CARTHAGE 161/69KV TRANSFORMER CKT 2	0	Transformer owned by City of Carthage and AECL	
10SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	110.6	110.8	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECL	
10SP	SWPA	SWPA	CARTHAGE 161/69KV TRANSFORMER CKT 2	84	109.2	109.3	CARTHAGE 161/69KV TRANSFORMER CKT 1	0	Transformer owned by City of Carthage and AECL	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	125.5	125.7	DYESS - SOUTH SPRINGDALE 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	114.4	114.9	CHAMBER SPRINGS - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	107.5	107.7	EAST FAYETTEVILLE REC - SOUTH SPRINGDALE 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	106.9	107.2	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FARMINGTON AECC 161KV	353	105.4	105.7	FLINT CREEK - GENTRY REC 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	107.8	107.9	CHAMBER SPRINGS 345/161KV TRANSFORMER	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	CHAMBER SPRINGS - FLINT CREEK 161KV	335	107.8	107.9	CHAMBER SPRINGS - CLARKSVILLE 345KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	166.2	167.2	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	149.9	150.4	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	146.5	147.4	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	123.5	124.2	FLINT CREEK - GENTRY REC 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	244	122.2	122.9	EAST CENTERTON - GENTRY REC 161KV	0	See Previous Upgrade Specified	
10SP	WERE	WERE	CHASE - WHITE JCT 69KV	43	103.3	103.4	WEAVER 138/69KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 634 Outage of the Weaver 138-69KV Transformer	
10SP	OMPA	AEPW	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	121.1	122.1	CORNVILLE - RUSH SPRINGS NATURAL GAS TAP 138KV	0	See Previous Upgrade Specified	
10SP	AEPW	OMPA	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	111.2	112.2	RUSH SPRINGS NATURAL GAS TAP - RUSH SPRINGS TAP 138KV	0	See Previous Upgrade Specified	
10SP	AEPW	OMPA	COMANCHE TAP - OMPA-DUNCAN 840 138KV	117	106.9	107.9	OMPA-MARLOW - RUSH SPRINGS TAP 138KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	DYESS - SOUTH SPRINGDALE 161KV	313	133.2	133.3	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	DYESS - SOUTH SPRINGDALE 161KV	313	108.0	108.1	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	111.3	111.4	LOWELL - TONTITOWN 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	109.4	109.5	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	108.4	108.5	LOWELL - ROGERS 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	105.8	105.9	CHAMBER SPRINGS - TONTITOWN 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	EAST CENTERTON - GENTRY REC 161KV	353	105.4	105.5	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	EAST FAYETTEVILLE REC - SOUTH SPRINGDALE 161KV	313	109.4	109.5	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	May Limit Renewal Rights	
10SP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	118.0	118.2	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115KV Transformer	
10SP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	103.8	103.9	MORRIS COUNTY - WEST EMPORIA 115KV	0	May be relieved due to Westar Transmission Operating Directive 1209 Outage of the Morris-West Emporia 115KV Line	
10SP	AEPW	AEPW	ELM SPRINGS REC - TONTITOWN 161KV	335	110.0	110.1	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	May Limit Renewal Rights	
10SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	223	107.5	107.7	BULL SHOALS - BULL SHOALS HES 161KV	0	May Limit Renewal Rights	
10SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	223	106.1	106.4	BULL SHOALS HES - FLIPPIN 161KV	0	May Limit Renewal Rights	
10SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	223	103.1	103.3	FLIPPIN - SUMMIT 161KV	0	May Limit Renewal Rights	
10SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	223	100.3	100.6	BEE BRANCH (AECC) - QUITMAN 161KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	313	115.8	116.0	DYESS - SOUTH SPRINGDALE 161KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	313	104.3	104.8	CHAMBER SPRINGS - TONTITOWN 161KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	114.7	114.8	LOWELL - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	112.8	112.9	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	111.8	111.9	LOWELL - ROGERS 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	109.2	109.3	CHAMBER SPRINGS - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	FLINT CREEK - GENTRY REC 161KV	353	108.8	108.9	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	353	117.0	117.1	CHAMBER SPRINGS 345/161KV TRANSFORMER	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	FLINT CREEK - TONTITOWN 161KV	353	117.0	117.1	CHAMBER SPRINGS - CLARKSVILLE 345KV	0	May Limit Renewal Rights	
10SP	WERE	WERE	GRANT JCT - MAHANNA 69KV	101	149.8	149.9	EVANS ENERGY CENTER NORTH - SEDGWICK COUNTY NO. 12 COLWICH 138KV	0	May be relieved due to Westar Transmission Operating Directive 1105 Outage of the Moundridge to Halstead 138 kV line, Gordon Evans to Halstead 138 kV line or loss of the Halstead 138 kV bus.	
10SP	WERE	WERE	GRANT JCT - RIPLEY 69KV	108	158.3	158.4	EVANS ENERGY CENTER NORTH - SEDGWICK COUNTY NO. 12 COLWICH 138KV	0	May be relieved due to Westar Transmission Operating Directive 1105 Outage of the Moundridge to Halstead 138 kV line, Gordon Evans to Halstead 138 kV line or loss of the Halstead 138 kV bus.	
10SP	AEPW	AEPW	HUGO - VALLEY TIMBER 69KV	48	101.3	101.7	ALLEN NATURAL GAS TAP - TUPELO 138KV	0	Possible Invalid Contingency	
10SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	210.4	210.5	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115KV Transformer	
10SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 1	68	169.8	170.0	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230KV Line	
10SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	184.1	184.3	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115KV Transformer	
10SP	WERE	WERE	KEENE - SOUTH ALMA 115KV CKT 2	92	148.6	148.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230KV Line	
10SP	WERE	WERE	KELLY - SOUTH SENECA 115KV	92	100.2	100.3	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230KV Line	
10SP	GRDA	GRDA	KINZIE 138/69KV TRANSFORMER	56	132.6	132.8	CENTRAL - STILLWATER 69KV	0	Solution Undetermined	
10SP	SPS	SPS	LUBBOCK EAST INTERCHANGE 230/115KV TRANSFORMER	172.5	113.7	113.8	LUBBOCK SOUTH INTERCHANGE 230/115KV TRANSFORMER	0	May be relieved due to Xcel Energy Transmission Operating Directive for Loss of the 230/115 kV autotransformer at Lubbock South	

Table 1 - SPP Facility Overloads Caused or Impacted
by 1200 MW Transfer using Scenario 1
Excludes OKGE Facilities

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	191.5	191.6	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 1	68	153.1	153.3	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	167.2	167.4	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	MCDOWELL CREEK SWITCHING STATION - SOUTH MANHATTAN 115KV CKT 2	92	133.7	133.9	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	ENTR	AEPW	MURFREESBORO - SOUTH NASHVILLE 138KV	118	102.0	102.1	3BISM RK - HOT SPRINGS WEST BUS 115KV	0	May Limit Renewal Rights	
10SP	AEPW	AEPW	PATTERSON - SOUTH NASHVILLE 138KV	118	122.4	122.5	3BISM RK - HOT SPRINGS WEST BUS 115KV	0	May Limit Rollover Rights	
10SP	AEPW	AEPW	SNYDER - TIPTON & HEADERICK 69KV	53	113.9	114.5	HOBART JCT - TAMARAC TAP 138KV	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV	68	194.5	194.7	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 1	68	155.7	155.8	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	170.0	170.1	EAST MANHATTAN 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	SOUTH ALMA - SOUTH MANHATTAN 115KV CKT 2	92	136.0	136.1	EAST MANHATTAN - JEFFREY ENERGY CENTER 230KV CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	EMDE	EMDE	SUB 383 - MONETT 161/69KV TRANSFORMER	150	102.5	102.6	SUB 124 - AURORA H.T. - SUB 383 - MONETT 161KV CKT 1	0	May Limit Renewal Rights	
10SP	GRDA	GRDA	COLLINSVILLE 161/69KV TRANSFORMER CKT 1	50	99.8	100.3	COLLINSVILLE 161/69KV TRANSFORMER CKT 2	483	May Limit Renewal Rights	
10SP	ENTR	AEPW	EUREKA SPRINGS - OSAGE CREEK (AECC) 161KV	223	99.8	100.0	HARRISON-EAST - SUMMIT 161KV	1195	May Limit Renewal Rights	
10SP	AEPW	AEPW	BLUE CIRCLE - CATOOSA 69KV	72	110.1	110.4	LYNN LANE TAP - LYNN LANE WEST TAP 138KV	1200	Invalid Contingency	
10SP	AEPW	AEPW	MCALESTER - WEELETKA 69KV	52	141.6	141.7	LONE OAK - SOUTH MCALESTER TAP 138KV	1200	Invalid Contingency	
10WP	WERE	WERE	166TH STREET - JARBALO JCT SWITCHING STATION 115KV	97	103.1	103.2	MIDLAND JCT - PENTAGON 115KV	0	May Limit Rollover Rights	
10WP	WERE	WERE	ANZIO - FORT JCT SWITCHING STATION 115KV	92	101.5	101.6	Multiple Outage Contingency: FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1 FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
10WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	275	120.0	120.9	CHAMBER SPRINGS - FARMINGTON AECC 161KV	0	See Previous Upgrade Specified	
10WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	275	110.7	111.2	FLINT CREEK - TONTITOWN 161KV	0	See Previous Upgrade Specified	
10WP	AEPW	AEPW	CHAMBER SPRINGS - TONTITOWN 161KV	275	106.2	107.0	FARMINGTON AECC - SOUTH FAYETTEVILLE 161KV	0	See Previous Upgrade Specified	
10WP	WERE	WERE	CIRCLEVILLE - HOYT HTI SWITCHING JCT 115KV	97	114.1	114.4	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	WERE	WERE	CIRCLEVILLE - KING HILL N.M. COOP 115KV	92	107.8	108.0	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	WERE	WERE	EAST STREET - WEST EMPORIA 115KV	92	107.2	107.4	MORRIS COUNTY 230/115KV TRANSFORMER CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
10WP	WERE	WERE	KELLY - KING HILL N.M. COOP 115KV	92	105.6	105.8	HOYT - STRANGER CREEK 345KV	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	SWPA	SWPA	NORFORK 161/69KV TRANSFORMER CKT 2	25	100.3	100.9	NORFORK 161/69KV TRANSFORMER CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	NORTH AMERICAN PHILIPS - NORTH AMERICAN PHILIPS JCT (SOUTH) 115KV	160	124.5	124.7	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 1	68	134.4	134.7	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	NORTH AMERICAN PHILIPS JCT (SOUTH) - WEST MCPHERSON 115KV CKT 2	92	117.3	117.5	EAST MCPHERSON - SUMMIT 230KV CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 1	68	105.4	105.5	FORT JCT SWITCHING STATION - WEST JCT CITY JCT (EAST) 115KV CKT 2	1200	Invalid Contingency	
									Total Estimated Cost	\$ 43,722,400

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
04G	MIPU	AECI	59216 BUTLER 5 161 to 96689 2BUTLER 69 CKT 1	56	99.6	100.3	59208 NEVADA 5 161 to 59216 BUTLER 5 161 CKT 1	
04G	MIPU	MIPU	59288 RGAFB 2 69 to 59284 GRDVWTP2 69 CKT 1	53	110.4	110.5	59225 PHILL 5 161 to 59280 PHILL 2 69 CKT 1	
04G	MIPU	MIPU	59289 BELTON 2 69 to 59288 RGAFB 2 69 CKT 1	53	104.9	105.1	59225 PHILL 5 161 to 59280 PHILL 2 69 CKT 1	
04G	MEC	MEC	63801 CBLUFFS5 161 to 63823 AVOCA 5 161 CKT 1	167	108.7	108.8	63800 CBLUFFS3 345 to 64056 MADISON3 345 CKT 1	
04G	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	100.6	100.7	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
04G	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	100.6	100.7	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
04G	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	103.2	103.3	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
04G	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	103.2	103.3	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
04SP	AECI	AECI	96095 5MANSFD 161 WND 2 MANSFLD1 1	56	105.9	106.0	96095 5MANSFD 161 to 97168 2MANSFL 69.0 to 97169 1MNSFLD2 CKT 2	
04SP	SWPA	ENTR	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	102.0	102.3	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT 1	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.2	112.6	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	109.7	110.1	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.1	106.4	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	104.4	104.8	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	101.9	102.2	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	
04SP	NPPD	NPPD	64953 SCHUYLR7 115 to 64954 SCHUYLR9 34.5 CKT 2	35	101.1	101.4	64953 SCHUYLR7 115 to 64954 SCHUYLR9 34.5 CKT 1	
04SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	105.7	106.1	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
04SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	103.3	103.7	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
04SP	AECI	AECI	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	119.8	120.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
04SP	AECI	AECI	96920 2ALPINE 69 to 96901 2KELYVIL 69 CKT 1	51	101.2	101.9	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
04SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	103.5	104.1	96889 2BRISTOW 69 to 96901 2KELYVIL 69 CKT 1	
04SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	99.2	101.6	96137 4BRISTOW 138 to 96140 4SILVCTY 138 CKT 1	
04SP	AECI	AECI	96984 2TENKILR 69 to 96879 2VIAN 69 CKT 1	36	100.3	100.5	54447 TAHLQH 2 69 to 96961 2PARK 69 CKT 1	
04SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	106.0	106.2	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
04SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	103.5	103.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
04SH	MEC	MEC	64220 WRIGHT 5 161 to 64201 WEBSTER5 161 CKT 1	216	107.4	107.5	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	
04SH	MEC	MEC	64602 AVO MID8 69 to 63823 AVOCA 5 161 CKT 2	50	107.9	108.0	63823 AVOCA 5 161 to 64603 AVOCMID8 69 CKT 1	
04SH	NPPD	NPPD	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 2	35	175.7	175.8	64755 BROKENB7 115 to 64756 BROKENBG 69 CKT 1	
04SH	AECI	AECI	96126 5MOBTAP 161 to 96120 5THMHIL 161 CKT 1	372	102.2	102.4	96044 7MCCRED 345 to 96049 7THOMHL 345 CKT 1	
04FA	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 1	100	115.7	116.0	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 2	
04FA	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 2	100	116.9	117.2	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 1	
04WP	AECI	AECI	96095 5MANSFD 161 WND 2 MANSFLD1 1	56	107.8	107.9	96095 5MANSFD 161 to 97168 2MANSFL 69.0 to 97169 1MNSFLD2 CKT 2	
04WP	AECI	AECI	96095 5MANSFD 161 WND 2 MANSFLD2 2	56	108.0	108.2	96095 5MANSFD 161 to 97168 2MANSFL 69.0 to 97170 1MNSFLD1 CKT 1	
04WP	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 1	100	105.7	105.9	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 2	
04WP	IP	MEC	32415 GALESBRG 138 to 64411 GALESBR5 161 CKT 2	100	107.0	107.2	64411 GALESBR5 161 to 32415 GALESBRG 138 CKT 1	
04WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	114.1	114.2	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
04WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	114.1	114.2	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
04WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	117.2	117.3	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
04WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	117.2	117.3	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
05AP	AEPW	CELE	53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	236	100.3	101.6	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT 1	May be relieved by Dolet Hills Operating Guide
05G			NONE IDENTIFIED					
05SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	101.3	101.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	100.3	100.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.7	113.1	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	108.9	109.3	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	107.3	107.6	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	103.7	104.0	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	101.9	102.2	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	
05SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	106.0	106.3	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
05SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	102.3	102.6	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
05SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	100.5	100.8	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
05SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	104.4	104.8	96889 2BRISTOW 69 to 96901 2KELYVIL 69 CKT 1	
05SP	AECI	AECI	96984 2TENKILR 69 to 96879 2VIAN 69 CKT 1	36	103.2	103.3	54447 TAHLQH 2 69 to 96961 2PARK 69 CKT 1	
05SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	110.4	110.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	109.8	110.0	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	107.5	107.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	106.7	106.9	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05SH	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	151.5	151.7	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	
05SH	MEC	MEC	64220 WRIGHT 5 161 to 64201 WEBSTER5 161 CKT 1	216	104.3	104.4	63719 HOPE 5 161 to 64648 HOPE MD8 69 CKT 1	
05SH	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	100.3	100.4	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
05SH	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	100.3	100.4	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
							Multiple Outage Contingency: 96049 7THOMHL 345 to 96044 7MCCRED 345 CKT 1 96044 7MCCRED 345 to 96043 7KINGDM 345 CKT 1	
05SH	AECI	AECI	96120 5THMHIL 161 96126 5MOBTAP 161 1	372	102.4	102.5		
05FA	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	100.9	101.1	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05FA	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	100.2	100.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
05FA	AECI	AECI	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	101.2	101.4	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
05WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	113.6	113.8	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
05WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	113.6	113.8	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
05WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	116.9	117.0	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
05WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	116.9	117.0	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
05WP	AECI	AECI	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	100.3	100.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
07SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	106.2	106.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
07SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	105.6	105.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
07SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	104.7	104.9	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
07SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	104.1	104.2	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECI.
07SP	AECI	AECI	96124 5HOLDEN 161 WND 2 HOLDEN 1	56	118.3	118.4	96110 5PITTSV 161 to 96124 5HOLDEN 161 CKT 1	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	113.4	113.7	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	109.5	109.8	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	108.7	109.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	103.1	103.4	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	102.2	102.4	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	
07SP	NPPD	NPPD	64860 HOSKINS7 115 to 64918 NORFK.N7 115 CKT 1	132	101.3	101.4	64860 HOSKINS7 115 to 64920 NORFOLK7 115 CKT 1	
07SP	AECI	AECI	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	36	101.7	101.8	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	
07SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	106.2	106.5	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
07SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	102.3	102.6	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
07SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	101.6	101.9	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
07SP	AECI	AECI	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	131.2	131.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
07SP	AECI	AECI	96920 2ALPINE 69 to 96901 2KELYVIL 69 CKT 1	51	110.9	111.3	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
07SP	AECI	AECI	96931 2FISHER 69 to 96920 2ALPINE 69 CKT 1	51	100.0	100.4	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
07SP	AECI	AECI	96936 2MANFORD 69 to 96931 2FISHER 69 CKT 1	36	106.4	106.9	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
07SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	109.5	109.6	96889 2BRISTOW 69 to 96901 2KELYVIL 69 CKT 1	
07WP	AECI	AECI	96081 5GAINES 161 WND 2 GAINESV L 1	56	100.6	100.7	52648 NORFORK5 161 to 96123 5WPLAIN 161 to 52615 PRG X3 113.8 CKT 1	
07WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	104.8	105.2	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
07WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	100.3	100.6	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
07WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	115.3	115.4	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
10SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	111.3	111.5	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECL
10SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	110.6	110.8	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECL
10SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	109.9	110.1	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	Transformer owned by City of Carthage and AECL
10SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	109.2	109.3	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 1	Transformer owned by City of Carthage and AECL
10SP	AECI	AECI	96124 5HOLDEN 161 WND 2 HOLDEN 1	56	126.2	126.3	96110 5PITTSV 161 to 96124 5HOLDEN 161 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	47	105.0	105.1	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	118.0	118.4	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	115.1	115.3	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.8	113.1	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.8	107.1	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.3	106.5	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	
10SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLNE 5 161 CKT 1	323	103.9	104.0	59955 JUNCTN 5 161 to 59969 BRKLNE 5 161 CKT 1	Third Party Line Owned by AECL
10SP	NPPD	NPPD	64860 HOSKINS7 115 to 64918 NORFK.N7 115 CKT 1	132	104.3	104.4	64860 HOSKINS7 115 to 64920 NORFOLK7 115 CKT 1	
10SP	NPPD	NPPD	64860 HOSKINS7 115 to 64920 NORFOLK7 115 CKT 1	132	102.3	102.4	64860 HOSKINS7 115 to 64918 NORFK.N7 115 CKT 1	
10SP	AECI	AECI	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	36	108.2	108.3	96654 2MILO 69 to 96802 2CLARK 69 CKT 1	
10SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	110.5	110.8	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	
10SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	107.4	107.7	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	
10SP	AECI	AECI	96751 2REEDS 69 to 96659 2BOWRML 69 CKT 1	36	105.3	105.6	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	
10SP	AECI	AECI	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	145.2	145.4	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
10SP	AECI	AECI	96920 2ALPINE 69 to 96901 2KELYVIL 69 CKT 1	51	123.7	124.1	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
10SP	AECI	AECI	96931 2FISHER 69 to 96920 2ALPINE 69 CKT 1	51	111.5	111.8	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
10SP	AECI	AECI	96936 2MANFORD 69 to 96931 2FISHER 69 CKT 1	36	118.2	118.6	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	
10SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	115.4	115.7	96889 2BRISTOW 69 to 96901 2KELYVIL 69 CKT 1	
10SP	AECI	AECI	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	51	99.5	101.5	96137 4BRISTOW 138 to 96140 4SILVCTY 138 CKT 1	
10SP	AECI	AECI	96984 2TENKILR 69 to 96879 2VIAN 69 CKT 1	36	117.7	117.8	54447 TAHLQH 2 69 to 96961 2PARK 69 CKT 1	
10SP	ENTR	AEPW	99389 4MURFRE 138 to 53321 SNASHVL4 138 CKT 1	118	102.0	102.1	99397 3BISMRK 115 to 99403 3HSEHVW 115 CKT 1	
10SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	223	107.5	107.7	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT 1	
10SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	223	106.1	106.4	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT 1	
10SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	223	103.1	103.3	99809 5FLIPN 161 to 99837 5SUMMIT 161 CKT 1	
10SP	ENTR	AEPW	99832 5OSAGE # 161 to 53136 EUREKA 5 161 CKT 1	223	100.3	100.6	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT 1	
10WP	AECI	AECI	96082 5GEORGE 161 WND 2 GRGTWN1 1	56	101.6	101.7	96105 5NORTON 161 to 96540 2NORTON 69.0 to 96539 1NORTON CKT 1	
10WP	AECI	AECI	96095 5MANSFD 161 WND 2 MANSFLD2 2	56	109.2	109.3	96095 5MANSFD 161 to 97168 2MANSFL 69.0 to 97170 1MNSFLD1 CKT 1	
10WP	AECI	AECI	96108 5OSCEOL 161 WND 2 OSCEOLA 1	56	110.0	110.2	96692 2CLINTN 69.0 to 96701 2GAINES 69.0 CKT 1	
10WP	AECI	AECI	96108 5OSCEOL 161 WND 2 OSCEOLA 1	56	100.9	101.1	96701 2GAINES 69.0 to 96810 2MTZION 69.0 CKT 1	
10WP	AECI	AECI	96108 5OSCEOL 161 WND 2 OSCEOLA 1	56	100.0	100.2	52698 STOCKT N5 161 to 96108 5OSCEOL 161 to 52697 NXA X1 113.8 CKT 1	
10WP	AECI	AECI	96692 2CLINTN 69.0 to 96701 2GAINES 69.0 CKT 1	43	106.8	107.0	96108 5OSCEOL 161 to 96811 2OSCEOL 69.0 to 96812 1OSCEOLA CKT 1	
10WP	AECI	AECI	96811 2OSCEOL 69.0 WND 1 OSCEOLA 1	56	109.0	109.2	96692 2CLINTN 69.0 to 96701 2GAINES 69.0 CKT 1	
10WP	AECI	AECI	96811 2OSCEOL 69.0 WND 1 OSCEOLA 1	56	100.8	101.0	96701 2GAINES 69.0 to 96810 2MTZION 69.0 CKT 1	
10WP	AMRN	AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	112.5	112.6	96043 7KINGDM 345 to 96090 5KINGDM 161 CKT 1	
10WP	AMRN	AMRN	31408 OVERTON 345 to 31409 OVERTON 161 CKT 1	300	112.5	112.6	96043 7KINGDM 345 to 96044 7MCCRED 345 CKT 1	
							Multiple Outage Contingency:	
10WP	AMRN	AMRN	31408*OVERTON 345 to 31409 OVERTON 161 CKT 1	300	102.0	102.1	96120 5THMHIL 161 to 96126 5MOBTAP 161 CKT 1	
10WP	MEC	MEC	64648 HOPE MD8 69 to 63719 HOPE 5 161 CKT 1	105	102.1	102.2	96126 5MOBTAP 161 to 96499 5HINTON 161 CKT 1	
10WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	115.1	115.2	64201 WEBSTER5 161 to 64220 WRIGHT 5 161 CKT 1	
10WP	OPPD	OPPD	65390 S1263T1T 161 to 65627 W BROCK8 69 CKT 1	53	115.1	115.2	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
10WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	118.7	118.8	65391 S975T4 T 161 to 65575 S975 8 69 CKT 1	
10WP	OPPD	OPPD	65463 S1263 5 161 to 65390 S1263T1T 161 CKT 1	53	118.7	118.8	64863 HUMBOLT5 161 to 65391 S975T4 T 161 CKT 1	
							Multiple Outage Contingency:	
10WP	AECI	AECI	96108 5OSCEOL 161 WND 2 OSCEOLA 1	56	102.2	102.3	96555 5GRAVOI 161 to 96552 5EDMONS 161 CKT 1	
							96555 5GRAVOI 161 to 96057 5BARNET 161 CKT 1	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	Comment
10WP	AECI	AECI	96120 5THMHIL 161 to 961265MOBTAP 161 CKT 1	386	100.4	100.5	Multiple Outage Contingency: 96049 7THOMHL 345 to 96044 7MCCRED 345 CKT 1 96044 7MCCRED 345 to 96043 7KINGDM 345 CKT 1	
10WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	112.3	112.5	Multiple Outage Contingency: 96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1 96108 5OSCEOL 161 to 52698 STOCKTN5161 CKT 1	
10WP	AECI	AECI	96692 2CLINTN 69 to 96701 2GAINES 69 CKT 1	43	104.2	104.5	96071 5CLINTN 161 to 96108 5OSCEOL 161 CKT 1	

Table 3 - OKGE Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	128.1	134.3	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	61.3	105.9	MEMORIAL - SKYLINE 138KV	849	Solution Undetermined	
04G	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	51.8	101.8	CIMARRON - NORTHWEST 345KV	1096	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	23.9	105.0	ARCADIA - REDBUD 345KV CKT 1	1119	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	23.8	104.7	ARCADIA - REDBUD 345KV CKT 2	1122	Solution Undetermined	
04G	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	68.8	100.2	DANFORTH - OMPA-EDMOND HAFER 138KV	1165	Solution Undetermined	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	89.4	108.5	DRAPER 345/138KV TRANSFORMER CKT 2	448	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	89.4	108.5	DRAPER 345/138KV TRANSFORMER CKT 1	448	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	87.0	104.6	DRAPER 345/138KV TRANSFORMER CKT 2	561	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	87.0	104.6	DRAPER 345/138KV TRANSFORMER CKT 1	561	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	61.2	120.4	DANFORTH - OMPA-EDMOND HAFER 138KV	641	Solution Undetermined	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	75.9	118.1	MCCLAIN - PLEASANT VALLEY 138KV	693	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.2	115.3	EASTERN AVE - OMPA-EDMOND HAFER 138KV	725	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	79.5	108.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	734	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	78.1	105.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	820	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	72.1	107.6	NORTHWEST - PANTHER 138KV	833	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	31.2	112.5	ARCADIA - DANFORTH 138KV	854	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	71.3	106.8	PANTHER - SILVER LAKE 138KV	857	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.5	108.8	DIVISION AVE - SILVER LAKE 138KV	871	Solution Undetermined	
04SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	72.3	105.3	MCCLAIN - PLEASANT VALLEY 138KV	897	Solution Undetermined	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	61.5	105.6	CIMARRON - HAYMAKER 138KV	903	Solution Undetermined	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	60.1	104.2	DIVISION AVE - HAYMAKER 138KV	926	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	47.1	106.1	EASTERN AVE - MEMORIAL 138KV	932	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.3	108.0	ARCADIA 345/138KV TRANSFORMER CKT 2	934	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.8	111.2	ARCADIA - NORTHWEST 345KV	944	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.1	105.2	ARCADIA 345/138KV TRANSFORMER CKT 1	1001	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.5	104.7	ARCADIA 345/138KV TRANSFORMER CKT 2	1018	Solution Undetermined	
04SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	74.9	102.3	MEMORIAL - TENNESSEE TAP 138KV	1046	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.4	101.4	DIVISION AVE - LAKESIDE 138KV	1062	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	20.9	108.8	ARCADIA - REDBUD 345KV CKT 1	1076	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	20.9	108.6	ARCADIA - REDBUD 345KV CKT 2	1079	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	20.0	102.6	ARCADIA - DANFORTH 138KV	1116	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.2	102.0	ARCADIA 345/138KV TRANSFORMER CKT 1	1121	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	8.1	101.0	ARCADIA - NORTHWEST 345KV	1174	Solution Undetermined	
04SP	OKGE	OKGE	ADA OC PUMP TAP - LULA 69KV	48	116.6	116.7	VALLY VIEW - VALLY VIEW TAP 69KV CKT 1	1200	Invalid Contingency	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	24.5	111.3	ARCADIA - REDBUD 345KV CKT 1	1042	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	24.4	111.1	ARCADIA - REDBUD 345KV CKT 2	1045	Solution Undetermined	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	70.4	101.5	DANFORTH - OMPA-EDMOND HAFER 138KV	1123	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	40.7	101.6	ARCADIA - NORTHWEST 345KV	1164	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	51.6	100.5	ARCADIA - DANFORTH 138KV	1185	Solution Undetermined	
04FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	131.9	138.6	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	101.7	102.5	SOUTH 4TH ST 138/69KV TRANSFORMER CKT 1	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	98.5	101.1	MCCLAIN - PLEASANT VALLEY 138KV	755	Solution Undetermined	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	15.9	102.4	ARCADIA - REDBUD 345KV CKT 1	1167	Solution Undetermined	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	15.9	102.2	ARCADIA - REDBUD 345KV CKT 2	1170	Solution Undetermined	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	61.4	106.9	MEMORIAL - SKYLINE 138KV	1045	Solution Undetermined	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	17.5	104.3	ARCADIA - REDBUD 345KV CKT 1	1141	Solution Undetermined	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	17.5	104.1	ARCADIA - REDBUD 345KV CKT 2	1144	Solution Undetermined	
05G	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	121.5	130.0	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.6	111.5	ARCADIA - REDBUD 345KV CKT 1	1017	Solution Undetermined	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.6	111.3	ARCADIA - REDBUD 345KV CKT 2	1021	Solution Undetermined	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	38.4	104.0	MEMORIAL - SKYLINE 138KV	1071	Solution Undetermined	

Table 3 - OKGE Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Southwest Power Pool System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	14.4	102.2	ARCADIA - NORTHWEST 345KV	1152	Solution Undetermined	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	23.9	100.3	ARCADIA - DANFORTH 138KV	1193	Solution Undetermined	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	95.2	116.9	DRAPER 345/138KV TRANSFORMER CKT 2	202	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	95.2	116.9	DRAPER 345/138KV TRANSFORMER CKT 1	202	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	92.6	112.4	DRAPER 345/138KV TRANSFORMER CKT 2	313	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	92.6	112.4	DRAPER 345/138KV TRANSFORMER CKT 1	313	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	82.8	129.9	MCCLAIN - PLEASANT VALLEY 138KV	553	Solution Undetermined	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	81.2	112.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	667	Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	58.8	117.5	DANFORTH - OMPA-EDMOND HAFER 138KV	699	Solution Undetermined	
05SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	60.8	100.6	FOREST HILL - SQUIRL CREEK 138KV	750	May be able to increase CTR (if relays will coordinate) at Shawnee sub.	\$ 5,000
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	79.6	108.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	753	Solution Undetermined	
05SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.9	99.8	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	773	At 800 MW the loading 100.3% and the facility is relieved by additional 200 MW, Solution Undetermined	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	78.2	114.8	MCCLAIN - PLEASANT VALLEY 138KV	786	Solution Undetermined	
05SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.7	99.6	CHIGLEY 138/69KV TRANSFORMER CKT 1	786	At 800 MW the loading 100.2% and the facility is relieved by additional 200 MW, Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.5	112.0	EASTERN AVE - OMPA-EDMOND HAFER 138KV	788	Solution Undetermined	
05SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	69.7	98.8	FOREST HILL - SQUIRL CREEK 138KV	808	At 1000 MW the loading 102.4% and the facility is relieved by additional 200 MW, Solution Undetermined	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	76.6	110.0	CIMARRON - CZECH HALL 138KV	813	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	66.6	113.1	CIMARRON - HAYMAKER 138KV	846	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	30.4	112.9	ARCADIA - DANFORTH 138KV	849	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	64.3	113.7	DIVISION AVE - HAYMAKER 138KV	853	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.2	110.0	ARCADIA 345/138KV TRANSFORMER CKT 2	889	Solution Undetermined	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	72.3	105.3	CZECH HALL - XEROX 138KV	895	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	52.7	110.6	DIVISION AVE - MUSTANG 138KV	915	Solution Undetermined	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	70.3	103.0	MORGAN - XEROX 138KV	935	Solution Undetermined	
05SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	68.6	104.7	MCCLAIN - PLEASANT VALLEY 138KV	936	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.5	111.0	ARCADIA - NORTHWEST 345KV	942	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	58.5	105.1	PLEASANT VALLEY - SOUTHGATE 138KV	943	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.9	107.3	ARCADIA 345/138KV TRANSFORMER CKT 1	948	Solution Undetermined	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	74.4	102.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	949	Solution Undetermined	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.2	101.8	MORGAN - MUSTANG 138KV	957	Solution Undetermined	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	64.6	102.7	DIVISION AVE - HAYMAKER 138KV	962	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.4	106.4	ARCADIA 345/138KV TRANSFORMER CKT 2	963	Solution Undetermined	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	66.2	102.2	CIMARRON - HAYMAKER 138KV	963	Solution Undetermined	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	56.1	100.5	DIVISION AVE - MUSTANG 138KV	999	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.1	103.7	ARCADIA 345/138KV TRANSFORMER CKT 1	1047	Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	43.9	102.1	EASTERN AVE - MEMORIAL 138KV	1068	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	18.3	106.5	ARCADIA - REDBUD 345KV CKT 1	1109	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	18.2	106.3	ARCADIA - REDBUD 345KV CKT 2	1112	Solution Undetermined	
05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	18.6	102.3	ARCADIA - DANFORTH 138KV	1118	Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.1	100.0	DIVISION AVE - LAKESIDE 138KV	1197	Solution Undetermined	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	95.7	124.5	GLENDALE - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	49.7	118.4	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	370	100.4	102.3	FT SMITH - MUSKOGEE 345KV CKT 1	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
05SH	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	94.7	116.1	MCCLAIN - PLEASANT VALLEY 138KV	105	Solution Undetermined	
05SH	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	370	99.2	101.0	FT SMITH - MUSKOGEE 345KV CKT 1	296	See Previous Upgrade Specified	
05SH	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	84.6	101.3	MCCLAIN - PLEASANT VALLEY 138KV	720	Solution Undetermined	

Table 3 - OKGE Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	76.7	108.5	DANFORTH - OMPA-EDMOND HAFER 138KV	769	Solution Undetermined	
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	72.3	104.0	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1005	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	56.3	105.6	ARCADIA - DANFORTH 138KV	1045	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	23.2	110.0	ARCADIA - REDBUD 345KV CKT 1	1060	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	23.1	109.8	ARCADIA - REDBUD 345KV CKT 2	1063	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	44.5	105.5	ARCADIA - NORTHWEST 345KV	1081	Solution Undetermined	
05FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	122.3	128.8	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
05FA	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	93.7	104.7	MCCLAIN - PLEASANT VALLEY 138KV	266	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	13.5	100.4	ARCADIA - REDBUD 345KV CKT 1	1194	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	13.5	100.2	ARCADIA - REDBUD 345KV CKT 2	1197	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	22.6	109.0	ARCADIA - REDBUD 345KV CKT 1	1075	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	22.6	108.8	ARCADIA - REDBUD 345KV CKT 2	1078	Solution Undetermined	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	97.0	123.0	DRAPER 345/138KV TRANSFORMER CKT 2	133	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	97.0	123.0	DRAPER 345/138KV TRANSFORMER CKT 1	133	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	94.1	117.8	DRAPER 345/138KV TRANSFORMER CKT 2	261	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	94.1	117.8	DRAPER 345/138KV TRANSFORMER CKT 1	261	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	95.6	104.2	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	460	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	95.4	104.1	CHIGLEY 138/69KV TRANSFORMER CKT 1	483	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	81.6	135.5	MCCLAIN - PLEASANT VALLEY 138KV	571	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	83.2	117.3	NORTHWEST 345/138KV TRANSFORMER CKT 2	600	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	94.1	102.6	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	637	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	93.9	102.5	CHIGLEY 138/69KV TRANSFORMER CKT 1	650	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	59.8	124.4	DANFORTH - OMPA-EDMOND HAFER 138KV	671	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	81.5	113.3	NORTHWEST 345/138KV TRANSFORMER CKT 2	684	Solution Undetermined	
07SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	62.3	111.4	FOREST HILL - SQUIRL CREEK 138KV	700	See Previous Upgrade Specified	
07SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	71.9	107.7	FOREST HILL - SQUIRL CREEK 138KV	729	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	54.2	118.5	EASTERN AVE - OMPA-EDMOND HAFER 138KV	762	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	77.9	117.3	CIMARRON - CZECH HALL 138KV	807	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	78.2	120.3	MCCLAIN - PLEASANT VALLEY 138KV	817	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	29.3	117.7	ARCADIA - DANFORTH 138KV	828	Solution Undetermined	
07SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	98.3	102.1	KENTUCKY TAP - SAGE 69KV	852	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	52.0	114.5	ARCADIA 345/138KV TRANSFORMER CKT 2	853	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	66.3	120.5	CIMARRON - HAYMAKER 138KV	872	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	86.7	104.3	MEMORIAL - TENNESSEE TAP 138KV	879	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	63.8	120.9	DIVISION AVE - HAYMAKER 138KV	882	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	76.2	107.6	NORTHWEST 345/138KV TRANSFORMER CKT 1	889	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	73.3	112.2	CZECH HALL - XEROX 138KV	893	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.7	111.6	ARCADIA 345/138KV TRANSFORMER CKT 1	906	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.2	110.4	ARCADIA 345/138KV TRANSFORMER CKT 2	914	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.4	106.3	DIVISION AVE - LAKESIDE 138KV	917	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	15.7	114.5	ARCADIA - NORTHWEST 345KV	924	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	71.2	109.7	MORGAN - XEROX 138KV	933	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	51.2	117.6	DIVISION AVE - MUSTANG 138KV	957	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	44.1	108.0	EASTERN AVE - MEMORIAL 138KV	964	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	58.3	112.5	PLEASANT VALLEY - SOUTHGATE 138KV	970	Solution Undetermined	
07SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	68.1	109.5	MCCLAIN - PLEASANT VALLEY 138KV	971	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.9	107.5	ARCADIA 345/138KV TRANSFORMER CKT 1	975	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	67.0	108.9	CIMARRON - HAYMAKER 138KV	979	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	65.2	109.3	DIVISION AVE - HAYMAKER 138KV	983	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	74.7	103.8	NORTHWEST 345/138KV TRANSFORMER CKT 1	983	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	70.0	108.3	MORGAN - MUSTANG 138KV	1021	Solution Undetermined	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.1	105.8	ARCADIA - DANFORTH 138KV	1052	Solution Undetermined	

Table 3 - OKGE Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	56.1	106.9	DIVISION AVE - MUSTANG 138KV	1065	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	48.0	104.0	DIVISION AVE - SILVER LAKE 138KV	1070	Solution Undetermined	
07SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	75.5	105.5	MEMORIAL - TENNESSEE TAP 138KV	1074	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	60.7	104.5	DIVISION AVE - HAYMAKER 138KV	1090	Solution Undetermined	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.2	102.6	NORTHWEST - PANTHER 138KV	1094	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	68.2	102.6	DIVISION AVE - SILVER LAKE 138KV	1104	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	61.2	103.2	PLEASANT VALLEY - SOUTHGATE 138KV	1121	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - HAYMAKER 138KV	308	73.1	101.5	CIMARRON - CZECH HALL 138KV	1125	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	66.5	101.8	PANTHER - SILVER LAKE 138KV	1126	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	16.7	105.3	ARCADIA - REDBUD 345KV CKT 1	1128	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	16.6	105.1	ARCADIA - REDBUD 345KV CKT 2	1131	Solution Undetermined	
07SP	OKGE	OKGE	HEFNER - TULSA 138KV	222	80.8	101.1	84TH ST - TENNESSEE TAP 138KV	1144	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	3.2	102.4	ARCADIA - NORTHWEST 345KV	1149	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.9	100.5	FOREST HILL - MAUD 138KV	1184	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	16.5	100.2	DRAPER LAKE - POOST ROAD 138KV	1192	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.8	100.2	DANFORTH - OMPA-EDMOND HAFER 138KV	1193	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	19.9	107.3	ARCADIA - REDBUD 345KV CKT 1	1099	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	19.8	107.1	ARCADIA - REDBUD 345KV CKT 2	1101	Solution Undetermined	
10SP	OKGE	AEPW	BONANZA - BONANZA TAP 161KV	177	101.9	102.3	AES - TARBY 161KV	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	100.9	129.5	DRAPER 345/138KV TRANSFORMER CKT 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	100.9	129.5	DRAPER 345/138KV TRANSFORMER CKT 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	101.3	104.9	KENTUCKY TAP - SAGE 69KV	0	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	97.8	123.9	DRAPER 345/138KV TRANSFORMER CKT 2	96	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	97.8	123.9	DRAPER 345/138KV TRANSFORMER CKT 1	96	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	98.0	106.9	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	212	Solution Undetermined	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	97.8	106.7	CHIGLEY 138/69KV TRANSFORMER CKT 1	230	Solution Undetermined	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	96.3	105.0	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	373	Solution Undetermined	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	96.1	104.8	CHIGLEY 138/69KV TRANSFORMER CKT 1	390	Solution Undetermined	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	85.7	120.3	NORTHWEST 345/138KV TRANSFORMER CKT 2	523	Solution Undetermined	
10SP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	370	98.4	101.2	CLARKSVILLE - MUSKOGEE 345KV	576	See Previous Upgrade Specified	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	83.9	116.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	607	Solution Undetermined	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	78.1	133.6	MCCLAIN - PLEASANT VALLEY 138KV	684	Solution Undetermined	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	58.1	115.4	TINKER #2 - TINKER #5 138KV	704	May Limit Renewal Rights	
10SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	72.4	109.5	FOREST HILL - SQUIRL CREEK 138KV	730	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.6	121.4	DANFORTH - OMPA-EDMOND HAFER 138KV	737	Solution Undetermined	
10SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	59.6	110.4	FOREST HILL - SQUIRL CREEK 138KV	771	See Previous Upgrade Specified	
10SP	OKGE	OKGE	MAUD - SEMINOLE 138KV CKT 2	287	80.6	104.1	MAUD - SEMINOLE 138KV CKT 1	791	May Limit Renewal Rights	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	78.5	110.4	NORTHWEST 345/138KV TRANSFORMER CKT 1	825	Solution Undetermined	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	76.9	116.9	CIMARRON - CZECH HALL 138KV	832	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	76.7	120.1	MCCLAIN - PLEASANT VALLEY 138KV	837	Solution Undetermined	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	59.8	107.9	POOST ROAD - SE15TH 138KV	839	May Limit Renewal Rights	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	53.0	116.2	ARCADIA 345/138KV TRANSFORMER CKT 2	841	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	28.1	117.6	ARCADIA - DANFORTH 138KV	863	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	50.0	114.4	EASTERN AVE - OMPA-EDMOND HAFER 138KV	863	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	51.7	113.3	ARCADIA 345/138KV TRANSFORMER CKT 1	892	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	52.1	111.9	ARCADIA 345/138KV TRANSFORMER CKT 2	900	Solution Undetermined	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	76.9	106.4	NORTHWEST 345/138KV TRANSFORMER CKT 1	923	Solution Undetermined	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	81.8	104.5	GLENDAL - SE15TH 138KV	924	May Limit Renewal Rights	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	62.9	118.6	CIMARRON - HAYMAKER 138KV	925	Solution Undetermined	
10SP	OKGE	OKGE	PECAN CREEK 345/161KV TRANSFORMER	370	96.9	100.6	FT SMITH - MUSKOGEE 345KV CKT 1	937	See Previous Upgrade Specified	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	72.0	111.5	CZECH HALL - XEROX 138KV	938	Solution Undetermined	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	59.9	118.6	DIVISION AVE - HAYMAKER 138KV	941	Solution Undetermined	

Table 3 - OKGE Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	86.2	103.4	MEMORIAL - TENNESSEE TAP 138KV	951	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.8	109.0	ARCADIA 345/138KV TRANSFORMER CKT 1	958	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	12.6	112.6	ARCADIA - NORTHWEST 345KV	969	Solution Undetermined	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.7	108.9	MORGAN - XEROX 138KV	989	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	55.3	104.1	DIVISION AVE - LAKESIDE 138KV	1000	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	63.4	108.7	DIVISION AVE - HAYMAKER 138KV	1038	Solution Undetermined	
10SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	65.9	108.6	MCCLAIN - PLEASANT VALLEY 138KV	1038	Solution Undetermined	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	46.1	114.5	DIVISION AVE - MUSTANG 138KV	1038	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	65.5	108.6	CIMARRON - HAYMAKER 138KV	1046	Solution Undetermined	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	54.2	109.8	PLEASANT VALLEY - SOUTHGATE 138KV	1059	Solution Undetermined	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	12.9	103.8	ARCADIA - DANFORTH 138KV	1111	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	53.5	105.8	DIVISION AVE - MUSTANG 138KV	1119	Solution Undetermined	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	66.7	102.3	NORTHWEST - PANTHER 138KV	1122	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - HAYMAKER 138KV	308	73.1	102.0	CIMARRON - CZECH HALL 138KV	1135	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	68.5	107.4	MORGAN - MUSTANG 138KV	1144	Solution Undetermined	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	67.0	102.0	DIVISION AVE - SILVER LAKE 138KV	1144	Solution Undetermined	
10SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	58.2	102.8	DIVISION AVE - HAYMAKER 138KV	1147	Solution Undetermined	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	65.9	101.5	PANTHER - SILVER LAKE 138KV	1149	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	37.8	101.8	EASTERN AVE - MEMORIAL 138KV	1149	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.3	102.3	PLEASANT VALLEY - SOUTHGATE 138KV	1159	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	44.7	101.1	DIVISION AVE - SILVER LAKE 138KV	1171	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	12.5	101.2	ARCADIA - REDBUD 345KV CKT 1	1184	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	12.4	101.0	ARCADIA - REDBUD 345KV CKT 2	1187	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	16.3	100.1	FOREST HILL - MAUD 138KV	1196	Solution Undetermined	
10SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	82.1	100.0	INGLEWOOD - SQUIRL CREEK 138KV	1199	Solution Undetermined	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	85.0	170.6	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	124.6	164.1	GLENDALE - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	67.2	101.3	DRAPER LAKE - GM 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	69.0	100.6	DRAPER LAKE - MIDWEST TAP 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10WP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	72.1	104.8	MCCLAIN - PLEASANT VALLEY 138KV	585	Solution Undetermined	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	19.7	104.9	ARCADIA - REDBUD 345KV CKT 1	1132	Solution Undetermined	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	19.6	104.6	ARCADIA - REDBUD 345KV CKT 2	1135	Solution Undetermined	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	31.1	102.7	ARCADIA - NORTHWEST 345KV	1138	Solution Undetermined	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	41.4	101.2	ARCADIA - DANFORTH 138KV	1165	Solution Undetermined	
Total Cost										\$ 3,005,000

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	61.5	106.1	MEMORIAL - SKYLINE 138KV	880	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	32.5	113.8	ARCADIA - REDBUD 345KV CKT 1	968	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	32.4	113.6	ARCADIA - REDBUD 345KV CKT 2	971	Solution Undetermined	
04G	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	50.4	100.9	CIMARRON - NORTHWEST 345KV	1148	Solution Undetermined	
04SP	OKGE	OKGE	FT SMITH 500/161KV TRANSFORMER	480	101.8	102.4	FT SMITH 345/161KV TRANSFORMER CKT 1	0	OKGE Plans to Install 2nd 500-161kV transformer bank by 12/1/2004	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	88.3	107.8	DRAPER 345/138KV TRANSFORMER CKT 2	489	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	88.3	107.8	DRAPER 345/138KV TRANSFORMER CKT 1	489	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	85.9	103.8	DRAPER 345/138KV TRANSFORMER CKT 2	602	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	85.9	103.8	DRAPER 345/138KV TRANSFORMER CKT 1	602	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	59.7	119.6	DANFORTH - OMPA-EDMOND HAFER 138KV	658	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	54.7	114.5	EASTERN AVE - OMPA-EDMOND HAFER 138KV	742	Solution Undetermined	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	69.8	112.3	MCCLAIN - PLEASANT VALLEY 138KV	806	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	30.1	112.3	ARCADIA - DANFORTH 138KV	862	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	21.0	114.0	ARCADIA - NORTHWEST 345KV	890	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	69.1	105.2	NORTHWEST - PANTHER 138KV	907	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	74.7	103.5	NORTHWEST 345/138KV TRANSFORMER CKT 2	909	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	51.2	107.1	DIVISION AVE - SILVER LAKE 138KV	913	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	68.3	104.4	PANTHER - SILVER LAKE 138KV	930	Solution Undetermined	
04SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	78.3	106.1	MEMORIAL - TENNESSEE TAP 138KV	942	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	45.6	105.1	EASTERN AVE - MEMORIAL 138KV	959	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	28.7	117.0	ARCADIA - REDBUD 345KV CKT 1	964	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	48.3	106.8	ARCADIA 345/138KV TRANSFORMER CKT 2	966	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	28.6	116.8	ARCADIA - REDBUD 345KV CKT 2	967	Solution Undetermined	
04SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	67.8	101.1	MCCLAIN - PLEASANT VALLEY 138KV	983	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	22.8	105.8	ARCADIA - DANFORTH 138KV	1011	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	14.4	107.3	ARCADIA - NORTHWEST 345KV	1018	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	47.1	104.0	ARCADIA 345/138KV TRANSFORMER CKT 1	1047	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	47.5	103.2	ARCADIA 345/138KV TRANSFORMER CKT 2	1075	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	73.5	100.8	NORTHWEST 345/138KV TRANSFORMER CKT 2	1078	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	48.7	101.8	CIMARRON - NORTHWEST 345KV	1148	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	51.5	100.6	MEMORIAL - SKYLINE 138KV	1165	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	46.3	100.5	ARCADIA 345/138KV TRANSFORMER CKT 1	1179	Solution Undetermined	
04SP	OKGE	OKGE	ADA OC PUMP TAP - LULA 69KV	48	116.4	116.5	VALLY VIEW - VALLY VIEW TAP 69KV CKT 1	1200	Invalid Contingency	
04SH	OKGE	OKGE	CLEVELAND TAP - SOUTH 4TH ST 69KV	92	102.8	106.3	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	32.2	119.2	ARCADIA - REDBUD 345KV CKT 1	934	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	32.1	118.9	ARCADIA - REDBUD 345KV CKT 2	937	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	43.1	104.4	ARCADIA - NORTHWEST 345KV	1100	Solution Undetermined	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	68.8	100.3	DANFORTH - OMPA-EDMOND HAFER 138KV	1184	Solution Undetermined	
04SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	40.7	100.4	ARCADIA - NORTHWEST 345KV	1191	Solution Undetermined	
04FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	164.5	171.3	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	109.2	110.0	SOUTH 4TH ST 138/69KV TRANSFORMER CKT 1	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	100.4	102.0	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	23.5	110.0	ARCADIA - REDBUD 345KV CKT 1	1062	Solution Undetermined	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	23.4	109.8	ARCADIA - REDBUD 345KV CKT 2	1065	Solution Undetermined	
04FA	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	69.7	101.7	MEMORIAL - SKYLINE 138KV	1132	Solution Undetermined	
04FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	49.9	100.2	ARCADIA - NORTHWEST 345KV	1194	Solution Undetermined	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	63.7	110.1	MEMORIAL - SKYLINE 138KV	965	Solution Undetermined	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.3	112.9	ARCADIA - REDBUD 345KV CKT 1	1024	Solution Undetermined	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.3	112.7	ARCADIA - REDBUD 345KV CKT 2	1027	Solution Undetermined	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	60.8	103.5	KETCH - OMPA-FAIRVIEW 138KV	1123	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	36.6	102.9	ARCADIA - NORTHWEST 345KV	1147	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	53.0	102.0	ARCADIA - KAMO MEMORIAL 138KV	1157	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	52.5	101.7	HORSESHOE LAKE - KAMO MEMORIAL 138KV	1164	Solution Undeterminec	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	30.9	107.6	ARCADIA - REDBUD 345KV CKT 1	1093	Solution Undeterminec	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	30.9	107.4	ARCADIA - REDBUD 345KV CKT 2	1096	Solution Undeterminec	
05G	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	169.0	178.1	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	33.4	120.1	ARCADIA - REDBUD 345KV CKT 1	905	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	33.3	119.9	ARCADIA - REDBUD 345KV CKT 2	907	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	41.6	107.5	MEMORIAL - SKYLINE 138KV	982	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	15.2	106.1	ARCADIA - NORTHWEST 345KV	1073	Solution Undeterminec	
05G	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	13.7	104.8	ARCADIA - NORTHWEST 345KV	1092	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	44.0	101.2	KETCH - OMPA-FAIRVIEW 138KV	1164	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	22.1	100.7	ARCADIA - DANFORTH 138KV	1182	Solution Undeterminec	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	94.5	116.5	DRAPER 345/138KV TRANSFORMER CKT 2	232	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	94.5	116.5	DRAPER 345/138KV TRANSFORMER CKT 1	232	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	91.9	111.9	DRAPER 345/138KV TRANSFORMER CKT 2	342	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	91.9	111.9	DRAPER 345/138KV TRANSFORMER CKT 1	342	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	75.9	123.3	MCCLAIN - PLEASANT VALLEY 138KV	694	Solution Undeterminec	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.5	116.8	DANFORTH - OMPA-EDMOND HAFER 138KV	713	Solution Undeterminec	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	77.1	108.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	796	Solution Undeterminec	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	52.2	111.3	EASTERN AVE - OMPA-EDMOND HAFER 138KV	804	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	29.7	112.9	ARCADIA - DANFORTH 138KV	852	Solution Undeterminec	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	73.0	110.1	MCCLAIN - PLEASANT VALLEY 138KV	862	Solution Undeterminec	
05SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	68.5	98.1	FOREST HILL - SQUIRL CREEK 138KV	871	At 1000 MW the loading 101.7% and the facility is relieved by additional 200 MW. Solution Undetermined	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	75.7	105.0	NORTHWEST 345/138KV TRANSFORMER CKT 2	879	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	20.2	114.2	ARCADIA - NORTHWEST 345KV	887	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.4	109.0	ARCADIA 345/138KV TRANSFORMER CKT 2	913	Solution Undeterminec	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.8	103.7	CIMARRON - CZECH HALL 138KV	927	Solution Undeterminec	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	56.7	106.6	DIVISION AVE - HAYMAKER 138KV	930	Solution Undeterminec	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	58.1	105.1	CIMARRON - HAYMAKER 138KV	937	Solution Undeterminec	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	46.5	104.8	DIVISION AVE - MUSTANG 138KV	964	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.2	106.3	ARCADIA 345/138KV TRANSFORMER CKT 1	971	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	26.5	115.2	ARCADIA - REDBUD 345KV CKT 1	989	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	26.5	115.0	ARCADIA - REDBUD 345KV CKT 2	991	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	48.6	105.2	ARCADIA 345/138KV TRANSFORMER CKT 2	993	Solution Undeterminec	
05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	21.6	105.9	ARCADIA - DANFORTH 138KV	995	Solution Undeterminec	
05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	12.6	106.8	ARCADIA - NORTHWEST 345KV	1021	Solution Undeterminec	
05SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	75.8	102.8	MEMORIAL - TENNESSEE TAP 138KV	1022	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	47.4	102.4	ARCADIA 345/138KV TRANSFORMER CKT 1	1099	Solution Undeterminec	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	42.6	101.3	EASTERN AVE - MEMORIAL 138KV	1117	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.3	100.7	ARCADIA - NORTHWEST 345KV	1178	Solution Undeterminec	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	93.6	122.8	GLENDALE - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	42.1	111.6	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	88.1	109.8	MCCLAIN - PLEASANT VALLEY 138KV	243	Solution Undeterminec	
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	75.5	107.7	DANFORTH - OMPA-EDMOND HAFER 138KV	823	Solution Undeterminec	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	31.4	118.6	ARCADIA - REDBUD 345KV CKT 1	942	Solution Undeterminec	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	31.3	118.4	ARCADIA - REDBUD 345KV CKT 2	944	Solution Undeterminec	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	47.4	109.2	ARCADIA - NORTHWEST 345KV	1011	Solution Undeterminec	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	55.8	105.7	ARCADIA - DANFORTH 138KV	1045	Solution Undetermined	
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	71.1	103.2	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1047	Solution Undetermined	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	44.7	104.8	ARCADIA - NORTHWEST 345KV	1096	Solution Undetermined	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	52.8	101.8	ARCADIA - DANFORTH 138KV	1149	Solution Undetermined	
05FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	166.1	172.6	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
05FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	108.0	108.9	SOUTH 4TH ST 138/69KV TRANSFORMER CKT 1	0	Possible Invalid Contingency	
05FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	99.2	101.0	IMO TAP - SOUTH 4TH ST 138KV	510	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	21.8	108.9	ARCADIA - REDBUD 345KV CKT 1	1077	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	21.8	108.6	ARCADIA - REDBUD 345KV CKT 2	1080	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	28.3	100.1	ARCADIA - NORTHWEST 345KV	1196	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	30.5	117.4	ARCADIA - REDBUD 345KV CKT 1	960	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	30.5	117.2	ARCADIA - REDBUD 345KV CKT 2	963	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	51.4	103.1	ARCADIA - NORTHWEST 345KV	1130	Solution Undetermined	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	96.0	122.2	DRAPER 345/138KV TRANSFORMER CKT 2	179	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	96.0	122.2	DRAPER 345/138KV TRANSFORMER CKT 1	179	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	93.2	117.0	DRAPER 345/138KV TRANSFORMER CKT 2	303	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	93.2	117.0	DRAPER 345/138KV TRANSFORMER CKT 1	303	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	93.9	102.8	CHIGLEY - WYNNWOOD TAP 138KV CKT 1	656	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	93.7	102.6	CHIGLEY 138/69KV TRANSFORMER CKT 1	671	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	58.9	123.9	DANFORTH - OMPA-EDMOND HAFER 138KV	681	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	79.2	113.5	NORTHWEST 345/138KV TRANSFORMER CKT 2	728	Solution Undetermined	
07SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	60.5	109.9	FOREST HILL - SQUIRL CREEK 138KV	734	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	75.0	129.3	MCCLAIN - PLEASANT VALLEY 138KV	737	Solution Undetermined	
07SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	70.6	106.8	FOREST HILL - SQUIRL CREEK 138KV	759	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.3	118.0	EASTERN AVE - OMPA-EDMOND HAFER 138KV	773	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.3	101.0	CHIGLEY - WYNNWOOD TAP 138KV CKT 1	796	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	98.5	102.5	KENTUCKY TAP - SAGE 69KV	803	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	77.8	109.8	NORTHWEST 345/138KV TRANSFORMER CKT 2	810	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.2	100.9	CHIGLEY 138/69KV TRANSFORMER CKT 1	821	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	28.8	117.7	ARCADIA - DANFORTH 138KV	834	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.5	117.6	ARCADIA - NORTHWEST 345KV	878	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.1	113.4	ARCADIA 345/138KV TRANSFORMER CKT 2	879	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.4	103.6	ARCADIA - NORTHWEST 345KV	879	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	73.4	115.8	MCCLAIN - PLEASANT VALLEY 138KV	881	Solution Undetermined	
07SP	OKGE	OKGE	EARLSBORO - FOREST HILL 69KV	48	47.1	104.0	FOREST HILL - MAUD 138KV	906	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	71.3	111.1	CIMARRON - CZECH HALL 138KV	915	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.9	110.5	ARCADIA 345/138KV TRANSFORMER CKT 1	930	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.4	109.0	ARCADIA 345/138KV TRANSFORMER CKT 2	946	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	56.5	114.0	DIVISION AVE - HAYMAKER 138KV	954	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	58.1	112.7	CIMARRON - HAYMAKER 138KV	958	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	85.0	102.9	MEMORIAL - TENNESSEE TAP 138KV	969	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	19.5	109.6	ARCADIA - DANFORTH 138KV	969	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	43.1	107.5	EASTERN AVE - MEMORIAL 138KV	974	Solution Undetermined	
07SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	79.3	109.7	MEMORIAL - TENNESSEE TAP 138KV	979	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	72.6	104.1	NORTHWEST 345/138KV TRANSFORMER CKT 1	993	Solution Undetermined	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	9.7	109.2	ARCADIA - NORTHWEST 345KV	1003	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	66.6	105.9	CZECH HALL - XEROX 138KV	1005	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	45.4	112.0	DIVISION AVE - MUSTANG 138KV	1006	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.0	114.2	ARCADIA - REDBUD 345KV CKT 1	1009	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.1	106.1	ARCADIA 345/138KV TRANSFORMER CKT 1	1009	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.0	114.0	ARCADIA - REDBUD 345KV CKT 2	1012	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.8	103.1	DIVISION AVE - LAKESIDE 138KV	1033	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	52.2	106.8	PLEASANT VALLEY - SOUTHGATE 138KV	1057	Solution Undetermined	
07SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	63.2	104.9	MCCLAIN - PLEASANT VALLEY 138KV	1069	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	64.5	103.4	MORGAN - XEROX 138KV	1085	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.9	104.3	DIVISION AVE - HAYMAKER 138KV	1093	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	61.0	103.2	CIMARRON - HAYMAKER 138KV	1113	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	46.1	102.4	DIVISION AVE - SILVER LAKE 138KV	1120	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	63.3	102.0	MORGAN - MUSTANG 138KV	1131	Solution Undetermined	
07SP	OKGE	OMPA	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	48.6	101.9	MEMORIAL - SKYLINE 138KV	1140	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	51.8	102.9	DIVISION AVE - MUSTANG 138KV	1142	Solution Undetermined	
07SP	OKGE	OKGE	HEFNER - TULSA 138KV	222	80.2	100.9	84TH ST - TENNESSEE TAP 138KV	1155	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	71.3	100.6	NORTHWEST 345/138KV TRANSFORMER CKT 1	1165	Solution Undetermined	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	64.6	100.2	NORTHWEST - PANTHER 138KV	1190	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.0	100.2	ARCADIA - NORTHWEST 345KV	1193	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	60.2	104.2	DIVISION AVE - HAYMAKER 138KV	1196	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	27.9	115.6	ARCADIA - REDBUD 345KV CKT 2	963	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	27.9	115.9	ARCADIA - REDBUD 345KV CKT 1	980	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	14.9	103.1	ARCADIA - NORTHWEST 345KV	1126	Solution Undetermined	
10SP	OKGE	OKGE	3RDST - MULBROW 69KV	48	102.3	102.7	KILGORE - VBI 69KV	0	May Limit Renewal Rights	
10SP	OKGE	SWPA	BROWN - BROWN 138KV	120	100.0	101.7	GLASSES - RUSSETT 138KV	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	COLONY - FT SMITH 161KV	335	102.2	102.5	FT SMITH - QUANEX TAP 161KV	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	MASSARD 161/69KV TRANSFORMER	120	103.7	104.0	ARKOMA - FTSMITH 161KV CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	MASSARD 161/69KV TRANSFORMER	120	101.2	101.4	ARKOMA - FTSMITH 161KV CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	MASSARD 161/69KV TRANSFORMER	120	100.1	100.4	3RDST - ARKOMA 161KV CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	101.3	105.1	KENTUCKY TAP - SAGE 69KV	0	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	99.5	128.3	DRAPER 345/138KV TRANSFORMER CKT 2	20	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	99.5	128.3	DRAPER 345/138KV TRANSFORMER CKT 1	20	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	96.5	122.8	DRAPER 345/138KV TRANSFORMER CKT 2	153	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	96.5	122.8	DRAPER 345/138KV TRANSFORMER CKT 1	153	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	96.2	105.2	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	403	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	96.0	105.1	CHIGLEY 138/69KV TRANSFORMER CKT 1	422	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	94.4	103.3	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	582	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	94.3	103.1	CHIGLEY 138/69KV TRANSFORMER CKT 1	601	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	82.0	116.8	NORTHWEST 345/138KV TRANSFORMER CKT 2	646	Solution Undetermined	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.3	112.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	735	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	55.6	120.5	DANFORTH - OMPA-EDMOND HAFER 138KV	754	Solution Undetermined	
10SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	70.7	108.1	FOREST HILL - SQUIRL CREEK 138KV	777	Solution Undetermined	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	52.5	110.6	TINKER #2 - TINKER #5 138KV	813	May Limit Renewal Rights	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	70.9	126.8	MCCLAIN - PLEASANT VALLEY 138KV	823	Solution Undetermined	
10SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	57.1	108.3	FOREST HILL - SQUIRL CREEK 138KV	826	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.4	114.9	ARCADIA 345/138KV TRANSFORMER CKT 2	868	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	27.3	117.1	ARCADIA - DANFORTH 138KV	872	Solution Undetermined	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	48.9	113.6	EASTERN AVE - OMPA-EDMOND HAFER 138KV	880	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.1	112.0	ARCADIA 345/138KV TRANSFORMER CKT 1	919	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	15.3	115.7	ARCADIA - NORTHWEST 345KV	926	Solution Undetermined	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	71.4	115.0	MCCLAIN - PLEASANT VALLEY 138KV	929	Solution Undetermined	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.5	110.5	ARCADIA 345/138KV TRANSFORMER CKT 2	932	Solution Undetermined	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	75.1	107.2	NORTHWEST 345/138KV TRANSFORMER CKT 1	932	Solution Undetermined	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	55.2	104.0	POOST ROAD - SE15TH 138KV	940	May Limit Renewal Rights	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	39.8	108.5	DIVISION AVE - MUSTANG 138KV	964	Solution Undetermined	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	80.4	103.3	GLENDALE - SE15TH 138KV	970	May Limit Renewal Rights	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.8	110.2	CIMARRON - CZECH HALL 138KV	973	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.2	107.6	ARCADIA 345/138KV TRANSFORMER CKT 1	989	Solution Undeterminec	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.2	107.3	ARCADIA - DANFORTH 138KV	1029	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	52.1	111.2	DIVISION AVE - HAYMAKER 138KV	1043	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	54.1	110.3	CIMARRON - HAYMAKER 138KV	1047	Solution Undeterminec	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.5	103.3	NORTHWEST 345/138KV TRANSFORMER CKT 1	1049	Solution Undeterminec	
10SP	OKGE	OKGE	EARLSBORO - FOREST HILL 69KV	48	43.0	101.8	FOREST HILL - MAUD 138KV	1055	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	21.4	110.4	ARCADIA - REDBUD 345KV CKT 1	1061	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	21.4	110.2	ARCADIA - REDBUD 345KV CKT 2	1064	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	84.5	101.8	MEMORIAL - TENNESSEE TAP 138KV	1069	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	64.9	104.8	CZECH HALL - XEROX 138KV	1090	Solution Undeterminec	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	4.6	105.5	ARCADIA - NORTHWEST 345KV	1091	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	39.9	103.5	ARCADIA - NORTHWEST 345KV	1124	Solution Undeterminec	
10SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	60.6	103.5	MCCLAIN - PLEASANT VALLEY 138KV	1135	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	57.8	103.2	DIVISION AVE - HAYMAKER 138KV	1143	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	47.6	103.7	PLEASANT VALLEY - SOUTHGATE 138KV	1147	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	62.6	102.2	MORGAN - XEROX 138KV	1150	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.1	102.5	CIMARRON - HAYMAKER 138KV	1154	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	57.5	102.2	DIVISION AVE - HAYMAKER 138KV	1158	Solution Undeterminec	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	51.7	100.6	DIVISION AVE - LAKESIDE 138KV	1170	Solution Undeterminec	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	36.8	101.0	EASTERN AVE - MEMORIAL 138KV	1173	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	48.9	101.4	DIVISION AVE - MUSTANG 138KV	1180	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	61.4	100.7	MORGAN - MUSTANG 138KV	1183	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	39.5	100.2	ARCADIA - NORTHWEST 345KV	1194	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	44.0	100.1	NORTHWEST 345/138KV TRANSFORMER CKT 1	1198	Solution Undeterminec	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	75.8	162.6	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	121.7	161.6	GLENDAL - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	27.8	113.0	ARCADIA - REDBUD 345KV CKT 1	1019	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	27.7	112.8	ARCADIA - REDBUD 345KV CKT 2	1022	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	33.5	105.6	ARCADIA - NORTHWEST 345KV	1070	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	40.5	100.9	ARCADIA - DANFORTH 138KV	1172	Solution Undeterminec	
Total Cost									\$ -	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	155.3	162.4	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04G	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	64.0	114.7	CIMARRON - NORTHWEST 345KV	742	Solution Undetermined	
04G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	66.5	111.4	MEMORIAL - SKYLINE 138KV	748	Solution Undetermined	
04G	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	71.6	103.3	DANFORTH - OMPA-EDMOND HAFER 138KV	914	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.7	116.9	ARCADIA - REDBUD 345KV CKT 1	917	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.6	116.7	ARCADIA - REDBUD 345KV CKT 2	920	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - HORSESHOE LAKE 138KV	287	42.4	102.2	ARCADIA - NORTHWEST 345KV	1139	Solution Undetermined	
04G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	57.9	100.9	KETCH - OMPA-FAIRVIEW 138KV	1146	Solution Undetermined	
04G	OKGE	OKGE	ARCADIA - HORSESHOE LAKE 138KV	287	53.0	100.6	ARCADIA - DANFORTH 138KV	1175	Solution Undetermined	
04G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	53.0	100.4	ARCADIA - HORSESHOE LAKE 138KV	1180	Solution Undetermined	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	87.6	107.0	DRAPER 345/138KV TRANSFORMER CKT 2	513	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	87.6	107.0	54934 DRAPER 7 345 WND 2 DRAPER 3 1	513	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	64.5	124.1	DANFORTH - OMPA-EDMOND HAFER 138KV	582	Solution Undetermined	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	85.3	103.2	DRAPER 345/138KV TRANSFORMER CKT 2	628	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	85.3	103.2	54934 DRAPER 7 345 WND 2 DRAPER 3 1	628	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	59.5	119.0	EASTERN AVE - OMPA-EDMOND HAFER 138KV	666	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.1	108.8	NORTHWEST 345/138KV TRANSFORMER CKT 2	711	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	74.3	110.2	NORTHWEST - PANTHER 138KV	763	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.4	113.0	DIVISION AVE - SILVER LAKE 138KV	779	Solution Undetermined	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	73.5	109.4	PANTHER - SILVER LAKE 138KV	784	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	34.2	116.0	ARCADIA - DANFORTH 138KV	785	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	78.7	105.9	NORTHWEST 345/138KV TRANSFORMER CKT 2	791	Solution Undetermined	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	70.1	112.6	MCCLAIN - PLEASANT VALLEY 138KV	802	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	50.4	109.7	EASTERN AVE - MEMORIAL 138KV	832	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	23.7	116.5	ARCADIA - NORTHWEST 345KV	842	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	61.9	115.0	CIMARRON - NORTHWEST 345KV	879	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.6	109.7	ARCADIA 345/138KV TRANSFORMER CKT 2	889	Solution Undetermined	
04SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	81.2	108.8	MEMORIAL - TENNESSEE TAP 138KV	889	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	32.1	120.1	ARCADIA - REDBUD 345KV CKT 1	922	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	32.0	119.9	ARCADIA - REDBUD 345KV CKT 2	925	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	25.9	108.8	ARCADIA - DANFORTH 138KV	938	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	58.1	107.0	MEMORIAL - SKYLINE 138KV	939	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.3	107.0	ARCADIA 345/138KV TRANSFORMER CKT 1	956	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.7	106.2	ARCADIA 345/138KV TRANSFORMER CKT 2	971	Solution Undetermined	
04SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	68.0	101.3	MCCLAIN - PLEASANT VALLEY 138KV	980	Solution Undetermined	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.1	109.0	ARCADIA - NORTHWEST 345KV	981	Solution Undetermined	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.6	102.0	DIVISION AVE - LAKESIDE 138KV	1009	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	65.3	102.5	MEMORIAL - TENNESSEE TAP 138KV	1053	Solution Undetermined	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	58.6	102.2	QUAIL CREEK - SKYLINE 138KV	1058	Solution Undetermined	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.4	103.4	ARCADIA 345/138KV TRANSFORMER CKT 1	1064	Solution Undetermined	
04SP	OKGE	OKGE	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	52.4	101.5	MEMORIAL - SKYLINE 138KV	1114	Solution Undetermined	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.7	100.3	NORTHWEST 345/138KV TRANSFORMER CKT 1	1151	Solution Undetermined	
04SP	OKGE	OKGE	ADA OC PUMP TAP - LULA 69KV	48	116.6	116.7	VALLY VIEW - VALLY VIEW TAP 69KV CKT 1	1200	Invalid Contingency	
04SH	OKGE	OKGE	CLEVELAND TAP - SOUTH 4TH ST 69KV	92	104.2	107.7	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.5	122.3	ARCADIA - REDBUD 345KV CKT 1	890	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.4	122.1	ARCADIA - REDBUD 345KV CKT 2	893	Solution Undetermined	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	73.4	104.7	DANFORTH - OMPA-EDMOND HAFER 138KV	947	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	45.7	106.9	ARCADIA - NORTHWEST 345KV	1041	Solution Undetermined	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	54.7	104.0	ARCADIA - DANFORTH 138KV	1081	Solution Undetermined	
04SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	42.3	102.1	ARCADIA - NORTHWEST 345KV	1150	Solution Undetermined	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	69.2	100.6	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1169	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	166.2	173.2	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undeterminec	
04FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	108.9	109.7	SOUTH 4TH ST 138/69KV TRANSFORMER CKT 1	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	100.2	101.9	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undeterminec	
04FA	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	73.7	105.6	MEMORIAL - SKYLINE 138KV	977	Solution Undeterminec	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	27.0	113.4	ARCADIA - REDBUD 345KV CKT 1	1013	Solution Undeterminec	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	26.9	113.2	ARCADIA - REDBUD 345KV CKT 2	1016	Solution Undeterminec	
04FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	52.3	102.8	ARCADIA - NORTHWEST 345KV	1128	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	67.8	113.6	MEMORIAL - SKYLINE 138KV	837	Solution Undeterminec	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	29.4	116.5	ARCADIA - REDBUD 345KV CKT 1	974	Solution Undeterminec	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	29.4	116.3	ARCADIA - REDBUD 345KV CKT 2	977	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	63.4	105.5	KETCH - OMPA-FAIRVIEW 138KV	1076	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	56.4	104.7	ARCADIA - KAMO MEMORIAL 138KV	1097	Solution Undeterminec	
04WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	39.4	105.3	ARCADIA - NORTHWEST 345KV	1102	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	55.6	104.2	HORSESHOE LAKE - KAMO MEMORIAL 138KV	1108	Solution Undeterminec	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	59.7	101.8	OMPA-FAIRVIEW - SKYLINE 138KV	1159	Solution Undeterminec	
04WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	47.8	101.7	ARCADIA - DANFORTH 138KV	1161	Solution Undeterminec	
04WP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	36.2	100.8	ARCADIA - NORTHWEST 345KV	1186	Solution Undeterminec	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.1	111.5	ARCADIA - REDBUD 345KV CKT 1	1039	Solution Undeterminec	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.0	111.3	ARCADIA - REDBUD 345KV CKT 2	1042	Solution Undeterminec	
05G	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	170.1	179.3	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	37.4	123.9	ARCADIA - REDBUD 345KV CKT 1	853	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	37.4	123.6	ARCADIA - REDBUD 345KV CKT 2	856	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	45.1	111.2	MEMORIAL - SKYLINE 138KV	887	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.4	108.4	ARCADIA - NORTHWEST 345KV	1027	Solution Undeterminec	
05G	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.0	106.4	ARCADIA - NORTHWEST 345KV	1059	Solution Undeterminec	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	26.6	104.2	ARCADIA - DANFORTH 138KV	1088	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	46.4	103.5	KETCH - OMPA-FAIRVIEW 138KV	1099	Solution Undeterminec	
05G	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	23.9	102.7	ARCADIA - DANFORTH 138KV	1124	Solution Undeterminec	
05G	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	48.5	101.6	DANFORTH - OMPA-EDMOND HAFER 138KV	1129	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	33.2	101.7	HORSESHOE LAKE - KAMO MEMORIAL 138KV	1153	Solution Undeterminec	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	33.7	101.3	ARCADIA - KAMO MEMORIAL 138KV	1164	Solution Undeterminec	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	93.8	115.8	DRAPER 345/138KV TRANSFORMER CKT 2	258	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	93.8	115.8	54934 DRAPER 7 345 WND 2 DRAPER 3 1	258	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	91.3	111.3	DRAPER 345/138KV TRANSFORMER CKT 2	368	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	91.3	111.3	54934 DRAPER 7 345 WND 2 DRAPER 3 1	368	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	82.7	113.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	615	Solution Undeterminec	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	61.8	120.8	DANFORTH - OMPA-EDMOND HAFER 138KV	645	Solution Undeterminec	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	76.3	123.6	MCCLAIN - PLEASANT VALLEY 138KV	688	Solution Undeterminec	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	81.1	110.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	697	Solution Undeterminec	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.5	115.3	EASTERN AVE - OMPA-EDMOND HAFER 138KV	734	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	33.7	116.6	ARCADIA - DANFORTH 138KV	784	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	23.0	116.7	ARCADIA - NORTHWEST 345KV	841	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	52.9	112.2	ARCADIA 345/138KV TRANSFORMER CKT 2	842	Solution Undeterminec	
05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	73.3	110.2	MCCLAIN - PLEASANT VALLEY 138KV	860	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	51.6	109.3	ARCADIA 345/138KV TRANSFORMER CKT 1	900	Solution Undeterminec	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	75.8	104.3	NORTHWEST 345/138KV TRANSFORMER CKT 1	902	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	52.1	108.3	ARCADIA 345/138KV TRANSFORMER CKT 2	916	Solution Undeterminec	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	56.5	106.3	DIVISION AVE - HAYMAKER 138KV	932	Solution Undeterminec	
05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	24.7	108.8	ARCADIA - DANFORTH 138KV	933	Solution Undeterminec	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.1	102.9	CIMARRON - CZECH HALL 138KV	941	Solution Undeterminec	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	30.2	118.6	ARCADIA - REDBUD 345KV CKT 1	945	Solution Undeterminec	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	46.9	105.4	EASTERN AVE - MEMORIAL 138KV	946	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	30.1	118.3	ARCADIA - REDBUD 345KV CKT 2	947	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	57.0	103.9	CIMARRON - HAYMAKER 138KV	950	Solution Undetermined	
05SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	47.4	105.6	DIVISION AVE - MUSTANG 138KV	958	Solution Undetermined	
05SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	78.5	105.2	MEMORIAL - TENNESSEE TAP 138KV	966	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.7	105.5	ARCADIA 345/138KV TRANSFORMER CKT 1	983	Solution Undetermined	
05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	14.4	108.5	ARCADIA - NORTHWEST 345KV	983	Solution Undetermined	
05SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	63.0	102.4	DIVISION AVE - HAYMAKER 138KV	993	Solution Undetermined	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	74.3	101.0	NORTHWEST 345/138KV TRANSFORMER CKT 1	1042	Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	50.2	101.2	DIVISION AVE - SILVER LAKE 138KV	1106	Solution Undetermined	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	41.5	101.8	CIMARRON - NORTHWEST 345KV	1145	Solution Undetermined	
05SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	63.7	100.1	MCCLAIN - PLEASANT VALLEY 138KV	1149	Solution Undetermined	
05SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.1	100.2	DIVISION AVE - LAKESIDE 138KV	1178	Solution Undetermined	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	90.4	119.6	GLENDALE - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	38.0	107.3	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	88.2	109.9	MCCLAIN - PLEASANT VALLEY 138KV	239	Solution Undetermined	
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	79.7	111.7	DANFORTH - OMPA-EDMOND HAFER 138KV	589	Solution Undetermined	
05SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	75.3	107.2	EASTERN AVE - OMPA-EDMOND HAFER 138KV	844	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.1	122.0	ARCADIA - REDBUD 345KV CKT 1	894	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.1	121.7	ARCADIA - REDBUD 345KV CKT 2	896	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	59.8	109.3	ARCADIA - DANFORTH 138KV	942	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	50.1	111.6	ARCADIA - NORTHWEST 345KV	954	Solution Undetermined	
05SH	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	84.3	101.5	NORTHWEST 345/138KV TRANSFORMER CKT 2	1042	Solution Undetermined	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	46.5	106.4	ARCADIA - NORTHWEST 345KV	1060	Solution Undetermined	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	55.8	104.6	ARCADIA - DANFORTH 138KV	1069	Solution Undetermined	
05SH	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	60.9	101.8	ARCADIA 345/138KV TRANSFORMER CKT 2	1139	Solution Undetermined	
05FA	OKGE	OKGE	CLEVELAND TAP - IMO 69KV	36	169.1	175.9	IMO TAP - SOUTH 4TH ST 138KV	0	Solution Undetermined	
05FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	107.7	108.7	SOUTH 4TH ST 138/69KV TRANSFORMER CKT 1	0	Possible Invalid Contingency	
05FA	OKGE	OKGE	HEMLOCK TAP - NE ENID 69KV	48	99.0	100.9	IMO TAP - SOUTH 4TH ST 138KV	574	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.4	112.4	ARCADIA - REDBUD 345KV CKT 1	1028	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.4	112.2	ARCADIA - REDBUD 345KV CKT 2	1031	Solution Undetermined	
05FA	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	55.4	104.0	MEMORIAL - SKYLINE 138KV	1040	Solution Undetermined	
05FA	OKGE	OKGE	CLEVELAND TAP - SOUTH 4TH ST 69KV	92	97.6	100.3	IMO TAP - SOUTH 4TH ST 138KV	1048	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	31.3	103.3	ARCADIA - NORTHWEST 345KV	1117	Solution Undetermined	
05FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	40.0	100.3	ARCADIA - DANFORTH 138KV	1190	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	34.5	121.1	ARCADIA - REDBUD 345KV CKT 1	908	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	34.5	120.9	ARCADIA - REDBUD 345KV CKT 2	911	Solution Undetermined	
05WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	54.3	105.4	ARCADIA - NORTHWEST 345KV	1075	Solution Undetermined	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	96.8	123.0	DRAPER 345/138KV TRANSFORMER CKT 2	142	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	96.8	123.0	54934 DRAPER 7 345 WND 2 DRAPER 3 1	142	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	94.0	117.8	DRAPER 345/138KV TRANSFORMER CKT 2	268	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	94.0	117.8	54934 DRAPER 7 345 WND 2 DRAPER 3 1	268	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	84.5	118.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	554	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	62.4	127.2	DANFORTH - OMPA-EDMOND HAFER 138KV	627	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	82.8	114.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	631	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	93.8	102.6	CHIGLEY - WYNNWOOD TAP 138KV CKT 1	681	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	93.6	102.4	CHIGLEY 138/69KV TRANSFORMER CKT 1	697	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.8	121.4	EASTERN AVE - OMPA-EDMOND HAFER 138KV	721	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	74.9	129.1	MCCLAIN - PLEASANT VALLEY 138KV	732	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	32.6	121.1	ARCADIA - DANFORTH 138KV	787	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	53.9	116.8	ARCADIA 345/138KV TRANSFORMER CKT 2	812	Solution Undetermined	
07SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	55.9	105.7	FOREST HILL - SQUIRL CREEK 138KV	833	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	98.4	102.2	KENTUCKY TAP - SAGE 69KV	835	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	287	21.1	120.1	ARCADIA - NORTHWEST 345KV	845	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	77.4	108.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	848	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.2	100.8	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	852	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	52.5	113.8	ARCADIA 345/138KV TRANSFORMER CKT 1	864	Solution Undetermined	
07SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	67.5	103.8	FOREST HILL - SQUIRL CREEK 138KV	868	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	53.0	112.4	ARCADIA 345/138KV TRANSFORMER CKT 2	872	Solution Undetermined	
07SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	92.0	100.6	CHIGLEY 138/69KV TRANSFORMER CKT 1	877	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	73.3	115.6	MCCLAIN - PLEASANT VALLEY 138KV	881	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	46.7	110.8	EASTERN AVE - MEMORIAL 138KV	909	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	86.1	103.9	MEMORIAL - TENNESSEE TAP 138KV	913	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.1	106.2	DIVISION AVE - LAKESIDE 138KV	928	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	51.6	109.4	ARCADIA 345/138KV TRANSFORMER CKT 1	931	Solution Undetermined	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	21.9	111.9	ARCADIA - DANFORTH 138KV	931	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	70.4	110.1	CIMARRON - CZECH HALL 138KV	933	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	75.9	105.1	NORTHWEST 345/138KV TRANSFORMER CKT 1	939	Solution Undetermined	
07SP	OKGE	OKGE	REMINGTON PARK - STONEWALL 138KV	191	81.3	111.5	MEMORIAL - TENNESSEE TAP 138KV	946	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	55.9	113.5	DIVISION AVE - HAYMAKER 138KV	962	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	27.9	116.7	ARCADIA - REDBUD 345KV CKT 1	976	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	56.6	111.3	CIMARRON - HAYMAKER 138KV	976	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	27.8	116.5	ARCADIA - REDBUD 345KV CKT 2	978	Solution Undetermined	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	11.0	110.6	ARCADIA - NORTHWEST 345KV	982	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	50.3	106.5	DIVISION AVE - SILVER LAKE 138KV	993	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	45.8	112.4	DIVISION AVE - MUSTANG 138KV	1006	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	63.5	107.3	DIVISION AVE - HAYMAKER 138KV	1021	Solution Undetermined	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	68.4	103.9	NORTHWEST - PANTHER 138KV	1041	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	65.7	105.0	CZECH HILL - XEROX 138KV	1042	Solution Undetermined	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.6	103.1	PANTHER - SILVER LAKE 138KV	1072	Solution Undetermined	
07SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	51.6	106.3	PLEASANT VALLEY - SOUTHGATE 138KV	1074	Solution Undetermined	
07SP	OKGE	OMPA	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	50.8	103.9	MEMORIAL - SKYLINE 138KV	1075	Solution Undetermined	
07SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	63.1	104.8	MCCLAIN - PLEASANT VALLEY 138KV	1076	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	42.0	105.0	CIMARRON - NORTHWEST 345KV	1081	Solution Undetermined	
07SP	OKGE	OKGE	HEFNER - TULSA 138KV	222	81.6	102.1	84TH ST - TENNESSEE TAP 138KV	1097	May Limit Renewal Rights and May be a problem in the 06Sf	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.4	103.8	DIVISION AVE - HAYMAKER 138KV	1108	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	20.2	102.9	DANFORTH - OMPA-EDMOND HAFER 138KV	1118	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	63.6	102.5	MORGAN - XEROX 138KV	1120	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	19.2	102.0	FOREST HILL - MAUD 138KV	1137	Solution Undetermined	
07SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	52.4	101.1	HEFNER - LAKESIDE 138KV	1138	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	52.1	103.2	DIVISION AVE - MUSTANG 138KV	1139	Solution Undetermined	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.9	102.2	CIMARRON - HAYMAKER 138KV	1144	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.8	101.6	DRAPER LAKE - POOST ROAD 138KV	1147	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	41.5	101.7	CIMARRON - NORTHWEST 345KV	1155	Solution Undetermined	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.9	101.5	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1156	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	62.3	101.1	MORGAN - MUSTANG 138KV	1164	Solution Undetermined	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	67.1	100.6	CIMARRON - NORTHWEST 345KV	1177	Solution Undetermined	
07SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	52.3	100.8	MEMORIAL - SKYLINE 138KV	1180	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	31.9	119.5	ARCADIA - REDBUD 345KV CKT 1	930	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	31.8	119.3	ARCADIA - REDBUD 345KV CKT 2	933	Solution Undetermined	
07WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.1	105.6	ARCADIA - NORTHWEST 345KV	1066	Solution Undetermined	
10SP	OKGE	AEPW	BONANZA - BONANZA TAP 161KV	177	101.6	101.9	AES - TARBY 161KV	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	RENO - SUNNYLANE 69KV	96	101.3	105.1	KENTUCKY TAP - SAGE 69KV	0	May Limit Renewal Rights and May be a problem in the 06Sf	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	99.1	128.0	DRAPER 345/138KV TRANSFORMER CKT 2	39	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	99.1	128.0	54934 DRAPER 7 345 WND 2 DRAPER 3 1	39	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	96.1	122.4	DRAPER 345/138KV TRANSFORMER CKT 2	172	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	96.1	122.4	54934 DRAPER 7 345 WND 2 DRAPER 3 1	172	expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	95.9	104.9	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	436	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	95.7	104.7	CHIGLEY 138/69KV TRANSFORMER CKT 1	455	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	87.1	121.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	474	Solution Undeterminec	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	85.3	117.5	NORTHWEST 345/138KV TRANSFORMER CKT 2	554	Solution Undeterminec	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	94.1	102.9	CHIGLEY - WYNNEWOOD TAP 138KV CKT 1	625	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	PAOLI 138/69KV TRANSFORMER	50	94.0	102.7	CHIGLEY 138/69KV TRANSFORMER CKT 1	645	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	59.7	124.7	DANFORTH - OMPA-EDMOND HAFER 138KV	678	Solution Undeterminec	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	79.8	111.7	NORTHWEST 345/138KV TRANSFORMER CKT 1	780	Solution Undeterminec	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.0	117.7	EASTERN AVE - OMPA-EDMOND HAFER 138KV	799	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	54.6	118.2	ARCADIA 345/138KV TRANSFORMER CKT 2	803	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	31.5	121.3	ARCADIA - DANFORTH 138KV	808	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	71.5	127.4	MCCLAIN - PLEASANT VALLEY 138KV	814	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	53.3	115.3	ARCADIA 345/138KV TRANSFORMER CKT 1	853	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	53.7	113.7	ARCADIA 345/138KV TRANSFORMER CKT 2	862	Solution Undeterminec	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	50.0	108.4	TINKER #2 - TINKER #5 138KV	863	May Limit Renewal Rights	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	78.2	107.7	NORTHWEST 345/138KV TRANSFORMER CKT 1	876	Solution Undeterminec	
10SP	OKGE	OKGE	FOREST HILL - TECUMSEH 69KV	72	67.3	104.9	FOREST HILL - SQUIRL CREEK 138KV	889	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.2	118.4	ARCADIA - NORTHWEST 345KV	890	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	52.4	110.7	ARCADIA 345/138KV TRANSFORMER CKT 1	919	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	71.9	115.5	MCCLAIN - PLEASANT VALLEY 138KV	921	Solution Undeterminec	
10SP	OKGE	OKGE	MISSION HILL - SHAWNEE 69KV	51	52.1	103.7	FOREST HILL - SQUIRL CREEK 138KV	953	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	19.3	110.5	ARCADIA - DANFORTH 138KV	971	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - LAKESIDE 138KV	287	85.8	103.1	MEMORIAL - TENNESSEE TAP 138KV	975	May Limit Renewal Rights and May be a problem in the 06Sf	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.4	109.8	CIMARRON - CZECH HALL 138KV	983	Solution Undeterminec	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	53.2	102.1	POOST ROAD - SE15TH 138KV	986	May Limit Renewal Rights	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	55.3	104.2	DIVISION AVE - LAKESIDE 138KV	996	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	24.7	113.6	ARCADIA - REDBUD 345KV CKT 1	1018	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	24.6	113.4	ARCADIA - REDBUD 345KV CKT 2	1021	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	52.1	111.3	DIVISION AVE - HAYMAKER 138KV	1042	Solution Undeterminec	
10SP	OKGE	OKGE	TINKER #2 - TINKER #5 138KV	191	78.9	101.9	GLENDALE - SE15TH 138KV	1052	May Limit Renewal Rights	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	6.5	107.3	ARCADIA - NORTHWEST 345KV	1055	Solution Undeterminec	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	40.9	105.1	EASTERN AVE - MEMORIAL 138KV	1057	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	53.2	109.5	CIMARRON - HAYMAKER 138KV	1059	Solution Undeterminec	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.9	103.7	NORTHWEST - PANTHER 138KV	1074	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	61.2	105.9	DIVISION AVE - HAYMAKER 138KV	1090	Solution Undeterminec	
10SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	47.4	103.9	DIVISION AVE - SILVER LAKE 138KV	1093	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	40.9	109.5	DIVISION AVE - MUSTANG 138KV	1094	Solution Undeterminec	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	69.2	103.0	CIMARRON - NORTHWEST 345KV	1094	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	41.0	104.5	CIMARRON - NORTHWEST 345KV	1101	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	64.4	104.3	CZECH HALL - XEROX 138KV	1101	Solution Undeterminec	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.1	102.9	PANTHER - SILVER LAKE 138KV	1102	Solution Undeterminec	
10SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	61.1	104.0	MCCLAIN - PLEASANT VALLEY 138KV	1126	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.5	102.3	DANFORTH - OMPA-EDMOND HAFER 138KV	1138	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	57.8	103.3	DIVISION AVE - HAYMAKER 138KV	1142	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	47.6	103.7	PLEASANT VALLEY - SOUTHGATE 138KV	1148	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.6	101.5	FOREST HILL - MAUD 138KV	1155	Solution Undeterminec	
10SP	OKGE	OKGE	HEFNER - TULSA 138KV	222	81.0	101.0	84TH ST - TENNESSEE TAP 138KV	1158	May Limit Renewal Rights and May be a problem in the 06Sf	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	62.2	101.7	MORGAN - XEROX 138KV	1160	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	58.5	101.9	CIMARRON - HAYMAKER 138KV	1165	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.6	101.2	CIMARRON - NORTHWEST 345KV	1170	Solution Undeterminec	
10SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	49.7	102.2	DIVISION AVE - MUSTANG 138KV	1170	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.0	100.7	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1181	Solution Undeterminec	
10SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	72.3	100.9	MEMORIAL - TENNESSEE TAP 138KV	1182	Solution Undeterminec	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	68.2	100.4	CIMARRON - NORTHWEST 345KV	1185	Solution Undeterminec	
10SP	OKGE	OMPA	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	47.0	100.4	MEMORIAL - SKYLINE 138KV	1190	Solution Undeterminec	
10SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	44.6	100.7	NORTHWEST 345/138KV TRANSFORMER CKT 1	1190	Solution Undeterminec	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	60.9	100.3	MORGAN - MUSTANG 138KV	1194	Solution Undeterminec	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	15.8	100.1	DRAPER LAKE - POOST ROAD 138KV	1196	Solution Undeterminec	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	71.7	158.8	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	118.7	158.8	GLENDALE - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	31.7	116.8	ARCADIA - REDBUD 345KV CKT 1	965	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	31.6	116.6	ARCADIA - REDBUD 345KV CKT 2	968	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	36.3	108.4	ARCADIA - NORTHWEST 345KV	1006	Solution Undeterminec	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	44.5	104.8	ARCADIA - DANFORTH 138KV	1057	Solution Undeterminec	
10WP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	30.7	101.7	ARCADIA - NORTHWEST 345KV	1158	Solution Undeterminec	
Total Cost									\$ -	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	104.5	105.8	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	118.5	118.8	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	102.7	102.9	57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT 1	0	Rebuild 15.50-mile line (1192.5 kcmil 45/7 ACSR, 223 MVA, 245 MVA), Replace CTs and Wave Trap (2000 A.)	\$ 5,800,000
04G	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	100.7	100.8	56861 EMANHAT6 230 to 58758 CONCORD6 230 CKT 1	0	See Previous Upgrade Specified	
04G	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	100.7	100.8	58757 CONCORD3 115 to 58758 CONCORD6 230 CKT 1	0	See Previous Upgrade Specified	
04G	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	113.5	113.8	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	105.7	107.0	56797 WOLFCKR7 345 to 57981 LACYGNE7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	100.5	101.1	56794 ROSEHIL7 345 to 56797 WOLFCKR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	100.3	100.7	56791 BENTON 7 345 to 56797 WOLFCKR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04G	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	111.4	111.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04SP	GRRD	GRRD	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	119.8	120.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
04SP	SWPA	ENTR	52660 BULL SH5 161 to 99825 5MIDWAY# 161 CKT 1	162	102.0	102.3	99817 5ISES 1 161 to 99826 5MORFLD 161 CKT 1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals.	\$ 150,000
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.2	112.6	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	109.7	110.1	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.1	106.4	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	104.4	104.8	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
04SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	101.9	102.2	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
04SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	335	102.9	103.1	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT 1	0	Replace Farmington switch 8839	\$ 60,000
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	132.4	133.2	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Rebuild 12 miles with 2156MCM ACSR. Replace Chamber Springs wavetraps & reset relays.	\$ 7,200,000
04SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	122.3	122.8	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	118.7	119.5	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	100.2	100.9	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
04SP	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	106.6	106.7	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	0	Add 3rd 161/69 KV Transformer	\$ 1,250,000
04SP	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	106.9	107.0	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	0	See Previous Upgrade Specified	
04SP	OMP	AEPW	56204 OMDUNCN4 138 to 54157 COMMTAP4 138 CKT 1	117	105.7	106.7	54112 CORNVIL4 138 to 54155 RUSHNGT4 138 CKT 1	0	Rebuild 17.81 miles of 266 ACSR with 795 ACSR	\$ 6,100,000
04SP	AEPW	AEPW	53159 SOSPRDL5 161 to 53131 DYESS 5 161 CKT 1	313	100.9	101.0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Replace South Springdale Circuit Switcher & Jumpers	\$ 60,000
04SP	GRDA	GRDA	54510 KINZEGR4 138 to 54513 KINZEGR2 69 CKT 1	56	112.2	112.4	54453 CENTRL 2 69 to 96845 2STILWTR 69 CKT 1	0	Solution Undetermined	
04SP	GRDA	GRDA	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 1	78	107.6	108.9	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 1	0	Add 3rd 161/69 KV Transformer	\$ 1,400,000
04SP	GRDA	GRDA	54455 TAHLQH 5 161 to 54447 TAHLQH 2 69 CKT 1	78	109.1	109.5	54447 TAHLQH 2 69 to 54455 TAHLQH 5 161 CKT 1	0	See Previous Upgrade Specified	
04SP	AEPW	AEPW	54023 OKMULGE4 138 to 54049 EC.HEN-4 138 CKT 1	105	92.8	105.1	54023 OKMULGE4 138 to 54057 KELCO 4 138 CKT 1	705	Replace Okmulgee Wavetraps	\$ 40,000
04SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	99.4	100.1	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	1035	See Previous Upgrade Specified	
04SP	AEPW	AEPW	54049 EC.HEN-4 138 to 54028 WELETKA 138 CKT 1	105	88.6	100.9	54023 OKMULGE4 138 to 54057 KELCO 4 138 CKT 1	1115	Replace Weleetka Wavetraps	\$ 40,000
04SP	AEPW	AEPW	54004 ATOKA P2 69 to 54007 ATOKA--2 69 CKT 1	39	117.0	117.1	54022 LONEOAK4 138 to 54032 SMCALTP4 138 CKT 1	1200	Invalid Contingency	
04SP	AEPW	AEPW	54024 MCALEST2 69 to 54029 WELEETK2 69 CKT 1	52	120.0	120.4	54022 LONEOAK4 138 to 54032 SMCALTP4 138 CKT 1	1200	Invalid Contingency	
04SP	SWPA	SWPA	52694 SPRGFLD269.0 WND 1 SPF X3 1	25	100.2	100.5	52692 SPRGFLD5 161 to 52694 SPRGFLD269.0 to 52691 SPF X1 113.8 CKT 1	1200	An outage of Springfield transformer #1 overloads transformer #3. If this situation were to occur, SWPA would open either the high or low side breaker on transformer #3 to remove the overload. This does not introduce any other overloads.	
04SH	WERE	WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	100.2	100.4	57342 WJCCY3 115 to 57343 WJCCYTE3 115 CKT 1	0	Solution Undetermined	
							Multiple Outage Contingency:			
04SH	WERE	WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	100.1	100.3	57328 FT JCT 3 115 to 57343 WJCCYTE3 115 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
04SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	106.0	106.2	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	0	Transformer owned by City of Carthage and AECI.	
04SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	103.5	103.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 1	0	Transformer owned by City of Carthage and AECI.	
04SH	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	109.0	109.7	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
04SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	100.4	100.9	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
04SH	GRDA	GRDA	54513 KINZEGR2 69 to 54510 KINZEGR4 138 CKT 1	56	108.9	109.1	54453 CENTRL 2 69 to 96845 2STILWTR 69 CKT 1	0	Solution Undetermined	
04SH	WERE	WERE	57343 WJCCYTE3 115 to 57328 FT JCT 3 115 CKT 1	68	102.7	102.9	57328 FT JCT 3 115 to 57343 WJCCYTE3 115 CKT 1	1200	Invalid Contingency	

Table 1a - Modeling Representation for Table 1
Includes Bus Numbers and Bus Names

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04FA	WERE	WERE	57631 CC4VERN2 69 to 57623 ATHENS 2 69 CKT 1	45	107.6	107.8	56797 WOLFGRK7 345 to 57981 LACYGNE7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	117.4	117.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04FA	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	112.3	112.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04FA	WERE	WERE	57636 GREEN 2 69 to 57631 CC4VERN2 69 CKT 1	45	108.9	109.1	56797 WOLFGRK7 345 to 57981 LACYGNE7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1304 Overload of the Athens to Wolf Creek 69 kV Line	
04FA	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	110.2	110.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	124.5	124.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	105.5	105.7	57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT 1	0	See Previous Upgrade Specified	
04WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	101.0	101.2	56861 EMANHAT6 230 to 58758 CONCORD6 230 CKT 1	0	See Previous Upgrade Specified	
04WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	101.0	101.2	58757 CONCORD3 115 to 58758 CONCORD6 230 CKT 1	0	See Previous Upgrade Specified	
04WP	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	121.2	121.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	101.2	101.5	57982 IATAN 7 345 to 59199 ST JOE 3 345 CKT 1	0	Rebuild 15.15 mile line with 1192.5 kcmil ACSR.	\$ 3,200,000
04WP	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	119.4	119.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
04WP	SWPA	SWPA	52648 NORFORK5 161 WND 2 NFK X1 1	25	109.8	109.9	52648 NORFORK5 161 to 52650 NORFORK269.0 to 52651 NFK X2 113.8 CKT	0	Replace Norfolk Transformer	\$ 1,300,000
04WP	SWPA	SWPA	52650 NORFORK269.0 WND 1 NFK X1 1	25	109.0	109.1	52648 NORFORK5 161 to 52650 NORFORK269.0 to 52651 NFK X2 113.8 CKT	0	See Previous Upgrade Specified	
04WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCPPER3 115 CKT 1	68	100.5	100.8	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	Tear down double circuit, build single circuit with 1192.5 ACSR.	\$ 7,800,000
04WP	WERE	WERE	57039 ELPASO 4 138 to 57046 GILL S 4 138 CKT 1	210	108.6	108.8	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT 1	1200	Invalid Contingency	
05AP	AEPW	CELE	53461 WALLAKE4 138 to 50090 IPAPER 4 138 CKT 1	236	100.3	101.6	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT 1	0	May be relieved by Dolet Hills Operating Guide	
05AP	AEPW	AEPW	53446 S SHV 4 138 to 53461 WALLAKE4 138 CKT 1	210	103.6	104.9	50045 DOLHILL7 345 to 50046 DOLHILL6 230 CKT 1	0	May be relieved by Dolet Hills Operating Guide	
05G	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	118.4	118.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	113.1	113.2	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	110.9	111.0	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05G	WERE	WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	101.4	101.6	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	Rebuild 0.88 miles and reconductor with 1192.5 ACSR.	\$ 417,200
05G	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCPPER3 115 CKT 1	68	109.5	109.7	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05G	WERE	WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	100.0	100.1	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05G	WERE	WERE	57039 ELPASO 4 138 to 57046 GILL S 4 138 CKT 1	210	125.1	125.3	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT 1	1200	Invalid Contingency	
05G	WERE	WERE	57343 WJCCTYE3 115 to 57328 FT JCT 3 115 CKT 1	68	104.8	104.9	57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 1	1200	Invalid Contingency	
05SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	152.7	152.8	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	147.8	148.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	133.5	133.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	129.3	129.4	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.7	113.1	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	108.9	109.3	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	107.3	107.6	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	103.7	104.0	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	101.9	102.2	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
05SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	101.3	101.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
05SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	100.3	100.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
05SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	101.4	101.5	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT 1	0	Rebuild 10.24 miles with 2156 ACSR, replace Chamber Springs wavetrap, & replace Farmington AECC bus.	\$ 6,400,000
05SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	138.0	138.8	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	127.2	127.8	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	123.6	124.5	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	104.7	105.3	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	103.9	104.5	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SP	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	107.0	107.1	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	0	See Previous Upgrade Specified	
05SP	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	84	107.3	107.4	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	0	See Previous Upgrade Specified	
05SP	OMPA	AEPW	56204 OMDUNCN4 138 to 54157 COMMTAP4 138 CKT 1	117	109.8	110.6	54112 CORNVIL4 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
05SP	OMPA	AEPW	56204 OMDUNCN4 138 to 54157 COMMTAP4 138 CKT 1	117	100.2	101.0	54154 RUSHSPT4 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
05SP	AEPW	AEPW	53159 SOSPRDL5 161 to 53131 DYESS 5 161 CKT 1	313	104.8	104.9	53154 CHAMSPR5 161 to 53195 FARMGTNS 161 CKT 1	0	See Previous Upgrade Specified	
05SP	WERE	WERE	57309 WEMPOR13 115 to 57301 EAST ST3 115 CKT 1	92	108.5	108.6	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	101.7	101.8	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	\$ 450,000
05SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 1	68	144.0	144.1	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	139.3	139.5	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	126.0	126.1	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 2	92	121.9	122.1	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	GRDA	GRDA	54510 KINZEGRA 138 to 54513 KINZEGRA 69 CKT 1	56	116.4	116.6	54453 CENTRL 2 69 to 96845 2STILWTR 69 CKT 1	0	Solution Undetermined	
05SP	WERE	WERE	56853 LAWHILL6 230 WND 1 LAWHL29X 1	308	107.2	107.3	56853 LAWHILL6 230 to 56855 MIDLAND6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland JCT 230kV Line	
05SP	WERE	WERE	57250 LWRNCHL3 115 WND 2 LAWHL29X 1	308	105.2	105.3	56853 LAWHILL6 230 to 56855 MIDLAND6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland JCT 230kV Line	
05SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	129.9	130.1	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	125.8	126.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	113.5	113.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	109.8	110.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	132.2	132.3	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	128.1	128.2	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 2	92	115.5	115.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 2	92	111.8	112.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05SP	AEPW	AEPW	53806 BCIRCLE2 69 to 53811 CATOOSA2 69 CKT 1	72	101.9	102.2	53782 LLAN WT4 138 to 53816 LLANETP4 138 CKT 1	1200	Invalid Contingency	
05SP	AEPW	AEPW	54024 MCALEST2 69 to 54029 WEELETK2 69 CKT 1	52	127.0	127.4	54022 LONEOKA4 138 to 54032 SMCALTP4 138 CKT 1	1200	Invalid Contingency	
05SH	WERE	WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	103.0	103.2	57342 WJCCTY 3 115 to 57343 WJCCTYE3 115 CKT 1	0	Solution Undetermined	
05SH	WERE	WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	103.0	103.2	Multiple Outage Contingency: 57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 1 57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 2	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
05SH	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	147.8	147.9	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	129.2	129.4	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	110.4	110.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 0	0	Transformer owned by City of Carthage and AECL	
05SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	107.5	107.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT 0	0	Transformer owned by City of Carthage and AECL	
05SH	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	109.8	110.0	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 0	0	Transformer owned by City of Carthage and AECL	
05SH	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	106.7	106.9	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT 0	0	Transformer owned by City of Carthage and AECL	
05SH	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	115.6	116.3	53154 CHAMSPR5 161 to 53195 FARMGTNS 161 CKT 1	0	See Previous Upgrade Specified	
05SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	106.6	107.1	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
05SH	AEPW	AEPW	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	244	103.9	104.7	53157 SFAYTVL5 161 to 53195 FARMGTNS 161 CKT 1	0	See Previous Upgrade Specified	

Table 1a - Modeling Representation for Table 1
Includes Bus Numbers and Bus Names

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SH	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	84	100.2	100.4	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	0	See Previous Upgrade Specified	
05SH	GRDA	GRDA	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 2	84	100.5	100.7	54451 CLARMR 5 161 to 54479 CLARMR 2 69 CKT 1	0	See Previous Upgrade Specified	
05SH	WERE	WERE	57309 WEMPOR3 115 to 57301 EAST ST3 115 CKT 1	92	109.0	109.2	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05SH	WERE	WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	196	105.5	105.6	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT 1	0	Rebuild and reconductor 4.94 miles with 1192 ACSR.	\$ 1,100,000
05SH	WERE	WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	196	101.0	101.2	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05SH	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	140.7	140.8	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	123.1	123.3	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	129.5	129.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	113.1	113.2	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	131.3	131.5	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 2	92	114.7	114.8	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05SH	WERE	WERE	56920 TECHILL5 161 WND 1 1	69	100.2	100.3	57163 HOYT 3 115 to 57165 HTI JCT3 115 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 632 Overload of the Tecumseh Hill 161/115kV Transformer	
05SH	WERE	WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	100.9	101.1	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05SH	WERE	WERE	57343 WJCCTYE3 115 to 57342 WJCCTY 3 115 CKT 1	141	100.7	100.9	56773 SUMMIT 7 345 to 56873 SUMMIT 6 230 to 56813 SUMMIT 114.4 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05SH	AEPW	AEPW	54023 OKMULGE4 138 to 54049 EC.HEN-4 138 CKT 1	105	87.9	105.1	54023 OKMULGE4 138 to 54057 KELCO 4 138 CKT 1	845	See Previous Upgrade Specified	
05SH	AEPW	AEPW	54049 EC.HEN-4 138 to 54028 WELET4 138 CKT 1	105	84.1	101.4	54023 OKMULGE4 138 to 54057 KELCO 4 138 CKT 1	1106	See Previous Upgrade Specified	
05SH	SWPA	AECI	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 1	18.75	151.5	151.7	52640 DONIPHNS 161 to 97201 2DONIPH 69 CKT 2	1200	Local area problem. Transformer is owned by AECI.	
05SH	WERE	WERE	57343 WJCCTYE3 115 to 57328 FT JCT 3 115 CKT 1	68	104.3	104.5	57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 2	1200	Invalid Contingency	
05FA	WERE	WERE	57151 AUBURN 3 115 to 57167 KEENE 3 115 CKT 1	68	137.3	137.5	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57151 AUBURN 3 115 to 57167 KEENE 3 115 CKT 1	68	125.6	125.8	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	57151 AUBURN 3 115 to 57167 KEENE 3 115 CKT 2	92	120.0	120.2	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	109.9	110.0	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	GRRD	GRRD	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	101.2	101.4	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	0	GRDA to Construct 138/69 KV Fisher Sub. tapping Keystone -- Silver City 138 KV T-line by 8/2005	
05FA	EMDE	SWPA	59466 ATL109 5 161 to 52688 CARTHAG5 161 CKT 1	167	112.0	112.4	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT 1	0	Replace 600 Amp disconnect switches	\$ 60,000
05FA	EMDE	SWPA	59466 ATL109 5 161 to 52688 CARTHAG5 161 CKT 1	167	102.0	102.3	59476 ASB349 5 161 to 59491 PUR421 5 161 CKT 1	0	See Previous Upgrade Specified	
05FA	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	100.9	101.1	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
05FA	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	100.2	100.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
05FA	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLV3 115 CKT 1	97	111.8	112.0	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	57152 CIRCLV3 115 to 57331 KING HL3 115 CKT 1	92	106.2	106.4	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	57301 EAST ST3 115 to 57309 WEMPOR3 115 CKT 1	92	100.6	100.8	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
05FA	WERE	WERE	57368 EXIDE J3 115 to 57372 PHILIPS3 115 CKT 1	196	102.3	102.5	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	Rebuild and reconductor 0.34 miles with 1192 ACSR.	\$ 95,200
05FA	WERE	WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	196	107.5	107.7	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	57381 SUMMIT 3 115 to 57368 EXIDE J3 115 CKT 1	196	101.2	101.3	57371 NORTHVW3 115 to 57381 SUMMIT 3 115 CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 1	68	100.5	100.7	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05FA	WERE	WERE	57328 FT JCT 3 115 to 57343 WJCTYE3 115 CKT 1	68	100.2	100.4	56773 SUMMIT 7 345 to 56873 SUMMIT 6 230 to 56813 SUMMIT 114.4 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05FA	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	131.5	131.7	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	119.8	119.9	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 2	92	115.1	115.3	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 2	92	104.8	104.9	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	104.1	104.3	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05FA	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	122.4	122.6	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	110.5	110.7	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	106.9	107.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	113.5	114.0	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCIPHER3 115 CKT 1	68	122.5	123.0	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCIPHER3 115 CKT 2	92	106.9	107.3	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05FA	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	124.1	124.2	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	112.2	112.3	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05FA	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 2	92	108.3	108.5	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
05FA	EMDE	EMDE	59467 ORO110 5 161 to 59494 OAK432 5 161 CKT 1	214	101.3	101.6	59472 TIP292 5 161 to 59483 JOP389 5 161 CKT 1	0	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR.	\$ 800,000
05FA	WERE	WERE	57343 WJCTYE3 115 to 57342 WJCTY 3 115 CKT 1	141	105.9	106.1	56766 JEC N 7 345 to 56773 SUMMIT 7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 402 Outage of the Jeffrey Energy Center to Summit 345 kV Line	
05FA	WERE	WERE	57343 WJCTYE3 115 to 57342 WJCTY 3 115 CKT 1	141	105.5	105.7	56773 SUMMIT 7 345 to 56873 SUMMIT 6 230 to 56813 SUMMIT 114.4 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 617 Outage of the Summit 345/230kV Transformer	
05FA	EMDE	SWPA	59466 ATL109 5 161 to 52688 CARTHAG5 161 CKT 1	167	99.8	100.2	59485 CAR395 5 161 to 59491 PUR421 5 161 CKT 1	722	See Previous Upgrade Specified	
05FA	WERE	WERE	57039 ELPASO 4 138 to 57046 GILL S 4 138 CKT 1	210	115.5	115.7	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT 1	1200	Invalid Contingency	
05WP	WERE	WERE	57151 AUBURN 3 115 to 57167 KEENE 3 115 CKT 1	68	110.3	110.4	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05WP	GRRD	GRRD	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	100.3	100.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
05WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	103.1	103.6	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	112.3	112.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	108.1	108.4	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	AEPW	AEPW	54276 JERICHO3 115 WND 2	46	107.3	108.1	54287 AMOCOTP269.0 to 54289 CHLDR2WT69.0 CKT 1	0	Solution Undetermined	
05WP	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	105.3	105.4	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
05WP	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	106.2	106.5	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
05WP	SWPA	SWPA	52648 NORFORK5 161 WND 2 NFK X1 1	25	110.3	110.4	52648 NORFORK5 161 to 52650 NORFORK269.0 to 52651 NFK X2 113.8 CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	105.5	106.0	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCIPHER3 115 CKT 1	68	113.8	114.4	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
05WP	WERE	WERE	57039 ELPASO 4 138 to 57046 GILL S 4 138 CKT 1	210	103.4	103.6	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT 1	1200	Invalid Contingency	
05WP	AEPW	AEPW	54276 JERICHO3 115 WND 2	46	107.3	108.0	54289 CHLDR2WT69.0 to 54290 CHLD4WT 138 to 54305 WC2TERT 12.5 CKT 1	1200	Invalid Contingency	
07SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	172.2	172.3	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	155.1	155.3	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	150.6	150.7	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	135.6	135.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	GRRD	GRRD	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	131.2	131.5	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	113.4	113.7	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	109.5	109.8	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	108.7	109.0	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	103.1	103.4	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	102.2	102.4	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	106.2	106.4	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	104.7	104.9	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	105.6	105.7	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
07SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	104.1	104.2	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
07SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	108.8	108.9	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	101.2	101.6	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	145.8	146.7	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	133.8	134.3	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	130.1	130.9	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	110.1	110.8	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	109.1	109.8	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	OWPA	54157 COMMTAP4 138 to 56204 OMDUNCN4 138 CKT 1	117	112.5	113.4	54112 CORNVIL4 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	OWPA	54157 COMMTAP4 138 to 56204 OMDUNCN4 138 CKT 1	117	102.9	103.8	54154 RUSHSP74 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53159 SOSPRDL5 161 to 53131 DYESS 5 161 CKT 1	313	113.0	113.1	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Limits Renewal Rights	
07SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	103.0	103.1	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	0	Limits Renewal Rights and May be a problem in the 06SP	
07SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	353	100.5	100.6	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	0	Limits Renewal Rights and May be a problem in the 06SP	
07SP	WERE	WERE	57309 WEMPOR13 115 to 57301 EAST ST3 115 CKT 1	92	105.7	105.8	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
07SP	AEPW	AEPW	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	313	100.3	100.4	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT 1	0	Limits Renewal Rights	
07SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	105.9	106.0	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	103.4	103.5	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT 1	353	102.2	102.3	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
07SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 1	68	162.5	162.7	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57167 KEENE 3 115 to 57339 S ALMA 3 115 CKT 1	68	145.8	146.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	142.3	142.4	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	127.6	127.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	GRDA	GRDA	54510 KINZEGR4 138 to 54513 KINZEGR2 69 CKT 1	56	126.3	126.5	54453 CENTRL 2 69 to 96845 2STILWTR 69 CKT 1	0	Solution Undetermined	
07SP	SPS	SPS	51316 KRESS3 115 to 51315 KRESS2 69 CKT 1	44	153.6	153.8	51315 KRESS2 69 to 51316 KRESS3 115 CKT 2	0	May be relieved due to Xcel Energy Transmission Operating Directive for Loss of the Kress 115/69 kV autotransformer	
07SP	WERE	WERE	57335 MCDOWEL3 115 to 57340 SMANHAT3 115 CKT 1	68	147.1	147.2	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	131.2	131.5	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	WERE	WERE	57335 MCDOWEL3 115 to 57340 SMANHAT3 115 CKT 2	92	128.5	128.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	114.6	114.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	AEPW	AEPW	54125 HEADRIK2 69 to 54138 SNYDER-2 69 CKT 1	53	101.4	101.9	54126 HOB-JCT4 138 to 54158 TAMARTP4 138 CKT 1	0	Limits Renewal Rights and May be a problem in the 06SP	
07SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 1	68	149.5	149.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	133.5	133.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	

Table 1a - Modeling Representation for Table 1
Includes Bus Numbers and Bus Names

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 2	92	130.6	130.7	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
07SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 2	92	116.6	116.9	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
07SP	AEPW	AEPW	53806 BCIRCLE2 69 to 53811 CATOOSA2 69 CKT 1	72	104.8	105.0	53782 LLAN WT4 138 to 53816 LLANETP4 138 CKT 1	1200	Invalid Contingency	
07SP	AEPW	AEPW	54024 MCALEST2 69 to 54029 WELEETK2 69 CKT 1	52	134.2	134.5	54022 LONEOAK4 138 to 54032 SMCALTP4 138 CKT 1	1200	Invalid Contingency	
07WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	104.8	105.2	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07WP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	43	100.3	100.6	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
07WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	106.3	107.0	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	108.5	108.6	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	102.7	102.8	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	100.6	100.7	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
07WP	WERE	WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	111.3	111.8	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCPPER3 115 CKT 1	68	120.1	120.7	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCPPER3 115 CKT 2	92	104.8	105.3	56872 EMCPPER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
07WP	WERE	WERE	57301 EAST ST3 115 to 57309 WEMPOR3 115 CKT 1	92	99.9	100.1	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	446	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
07WP	WERE	WERE	57039 ELPASO 4 138 to 57046 GILL S 4 138 CKT 1	210	105.6	105.9	57040 EVANS N4 138 to 57041 EVANS S4 138 CKT 1	1200	Invalid Contingency	
10SP	AEPW	AEPW	54019 VALYTIM2 69 to 54041 ANTLTAP2 69 CKT 1	48	101.2	101.7	52800 TUPELO 4 138 to 54006 ALLENGT4 138 CKT 1	0	Possible Invalid Contingency	
10SP	AEPW	AEPW	54007 ATOKA--269.0 WND 1	36	105.7	105.8	52800 TUPELO 4 138 to 54006 ALLENGT4 138 CKT 1	0	Possible Invalid Contingency	
10SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	221.6	221.8	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 1	68	180.6	180.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	193.8	193.9	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57167 KEENE 3 115 to 57151 AUBURN 3 115 CKT 2	92	157.9	158.1	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	GRRD	GRRD	96901 2KELYVIL 69 to 96889 2BRISTOW 69 CKT 1	51	145.2	145.4	96936 2MANFORD 69 to 96943 2SILVCTY 69 CKT 1	0	GRDA to Construct 138/69 KV Fisher Sub, tapping Keystone -- Silver City 138 KV T-line by 6/2005	
10SP	SWPA	SPRM	52692 SPRGFLD5 161 to 59969 BRKLN5 5 161 CKT 1	323	103.9	104.0	59955 JUNCTN 5 161 to 59969 BRKLN5 5 161 CKT 1	0	Limits Renewal Rights	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	47	105.0	105.1	96654 2MILLO 69 to 96802 2CLARK 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	118.0	118.4	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	115.1	115.3	59479 LAR382 5 161 to 59480 MON383 5 161 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	112.8	113.1	52690 CARTHG 2 69 to 96649 2JASPER 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.8	107.1	96649 2JASPER 69 to 96651 2LAMAR 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	AECI	52690 CARTHG 2 69 to 96751 2REEDS 69 CKT 1	36	106.3	106.5	59537 AUR124 2 69 to 59578 AUR355 2 69 CKT 1	0	AECI third party line. No SWPA upgrades required.	
10SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X1 1	84	111.3	111.5	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
10SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X1 1	84	109.9	110.1	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52689 CRG X2 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
10SP	SWPA	SWPA	52688 CARTHAG5 161 WND 2 CRG X2 1	84	110.6	110.8	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
10SP	SWPA	SWPA	52690 CARTHG 269.0 WND 1 CRG X2 1	84	109.2	109.3	52688 CARTHAG5 161 to 52690 CARTHG 269.0 to 52687 CRG X1 113.8 CKT	0	Transformer owned by City of Carthage and AECI.	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	125.5	125.7	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	114.4	114.9	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	107.5	107.7	53159 SOSPRDL5 161 to 53193 EFAYTLV5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	106.9	107.2	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53154 CHAMSPR5 161 CKT 1	353	105.4	105.7	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	107.8	107.9	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 to 53120 CHAMSPR113.8 CKT 1	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53154 CHAMSPR5 161 to 53139 FLINTCR5 161 CKT 1	335	107.8	107.9	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	166.2	167.2	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	149.9	150.4	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	146.5	147.4	53157 SFAYTLV5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	123.5	124.2	53139 FLINTCR5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	244	122.2	122.9	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	WERE	WERE	57605 WHITE J269.0 to 57588 CHASE 269.0 CKT 1	43	103.3	103.4	56991 WEAVER 4 138 to 57604 WEAVER 269.0 to 57083 WEAVER 113.2 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 634 Outage of the Weaver 138-69kV Transformer	
10SP	OMPA	AEPW	56204 OMDUNCN4 138 to 54157 COMMTAP4 138 CKT 1	117	121.1	122.1	54112 CORNVIL4 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	OMPA	54157 COMMTAP4 138 to 56204 OMDUNCN4 138 CKT 1	117	111.2	112.2	54154 RUSHSPT4 138 to 54155 RUSHNGT4 138 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	OMPA	54157 COMMTAP4 138 to 56204 OMDUNCN4 138 CKT 1	117	106.9	107.9	54154 RUSHSPT4 138 to 56207 OMMARLO4 138 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53159 SOSPRDL5 161 to 53131 DYESS 5 161 CKT 1	313	133.2	133.3	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Limits Renewal Rights	

Table 1a - Modeling Representation for Table 1
Includes Bus Numbers and Bus Names

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	AEPW	AEPW	53159 SOSPRDL5 161 to 53131 DYESS 5 161 CKT	313	108.0		53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT	353	111.3	111.4	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT	0	Limits Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT	353	109.4	109.5	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Limits Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT	353	108.4	108.5	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	0	Limits Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT	353	105.8	105.9	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT	0	Limits Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	53133 ECNTRTN5 161 to 53187 GENTRYR5 161 CKT	353	105.4	105.5	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT	0	Limits Renewal Rights and May be a problem in the 06SP	
10SP	AEPW	AEPW	53193 EFAYTVL5 161 to 53159 SOSPRDL5 161 CKT	313	109.4	109.5	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Limits Renewal Rights	
10SP	WERE	WERE	57309 WEMPOR3 115 to 57301 EAST ST3 115 CKT 1	92	118.0	118.2	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
10SP	WERE	WERE	57309 WEMPOR3 115 to 57301 EAST ST3 115 CKT 1	92	103.8	103.9	57305 MORRIS 3 115 to 57309 WEMPOR3 115 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1209 Outage of the Morris-West Emporia 115kV Line	
10SP	AEPW	AEPW	53194 ELMSPRR5 161 to 53170 TONTITN5 161 CKT	335	110.0	110.1	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	Limits Renewal Rights	
10SP	ENTR	AEPW	99832 SOSAGE # 161 to 53136 EUREKA 5 161 CKT	223	107.5	107.7	52660 BULL SH5 161 to 99802 5BULLSH* 161 CKT	0	Limits Renewal Rights	
10SP	ENTR	AEPW	99832 SOSAGE # 161 to 53136 EUREKA 5 161 CKT	223	106.1	106.4	99802 5BULLSH* 161 to 99809 5FLIPN 161 CKT	0	Limits Renewal Rights	
10SP	ENTR	AEPW	99832 SOSAGE # 161 to 53136 EUREKA 5 161 CKT	223	103.1	103.3	99809 5FLIPN 161 to 99837 5SUMMIT 161 CKT	0	Limits Renewal Rights	
10SP	ENTR	AEPW	99832 SOSAGE # 161 to 53136 EUREKA 5 161 CKT	223	100.3	100.6	99519 5QUITMN 161 to 99799 5BEE BR 161 CKT	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT	313	115.8	116.0	53131 DYESS 5 161 to 53159 SOSPRDL5 161 CKT	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53195 FARMGTN5 161 to 53157 SFAYTVL5 161 CKT	313	104.3	104.8	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT	353	114.7	114.8	53144 LOWELL 5 161 to 53170 TONTITN5 161 CKT	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT	353	112.8	112.9	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT	353	111.8	111.9	53144 LOWELL 5 161 to 53152 ROGERS 5 161 CKT 1	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT	353	109.2	109.3	53154 CHAMSPR5 161 to 53170 TONTITN5 161 CKT	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53187 GENTRYR5 161 to 53139 FLINTCR5 161 CKT	353	108.8	108.9	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT	0	See Previous Upgrade Specified	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT	353	117.0	117.1	53154 CHAMSPR5 161 to 53155 CHAMSPR7 345 to 53120 CHAMSPR113.8 CKT	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53170 TONTITN5 161 to 53139 FLINTCR5 161 CKT	353	117.0	117.1	53155 CHAMSPR7 345 to 53756 CLARKSV7 345 CKT 1	0	Limits Renewal Rights	
10SP	WERE	WERE	57738 MAHANNA2 69 to 57800 GRANT J2 69 CKT 1	101	149.8	149.9	57040 EVANS N4 138 to 57065 SG12COL4 138 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1105 Outage of the Moundridge to Halstead 138 kV line, Gordon Evans to Halstead 138 kV line or loss of the Halstead 138 kV bus.	
10SP	WERE	WERE	57800 GRANT J2 69 to 57832 RIPLEYM2 69 CKT 1	108	158.3	158.4	57040 EVANS N4 138 to 57065 SG12COL4 138 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 1105 Outage of the Moundridge to Halstead 138 kV line, Gordon Evans to Halstead 138 kV line or loss of the Halstead 138 kV bus.	
10SP	AEPW	AEPW	54018 HUGO---2 69 to 54019 VALYTIM2 69 CKT 1	48	101.3	101.7	52800 TUPELO 4 138 to 54006 ALLENGT4 138 CKT	0	Possible Invalid Contingency	
10SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 1	68	210.4	210.5	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 1	68	169.8	170.0	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	184.1	184.3	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57339 S ALMA 3 115 to 57167 KEENE 3 115 CKT 2	92	148.6	148.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	57217 KELLY 3 115 to 57337 SENECA 3 115 CKT 1	92	100.2	100.3	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	GRDA	GRDA	54513 KINZEGR2 69 to 54510 KINZEGR4 138 CKT 1	56	132.6	132.8	54453 CENTRL 2 69 to 96845 2STILWTR 69 CKT 1	0	Solution Undetermined	
10SP	SPS	SPS	51689 LUBE6 230 to 51688 LUBE3 115 CKT 1	172.5	113.7	113.8	51680 LUBS3 115 to 51681 LUBS6 230 CKT 1	0	May be relieved due to Xcel Energy Transmission Operating Directive for Loss of the 230/115 kV autotransformer at Lubbock South	
10SP	WERE	WERE	57335 MCDOWEL3 115 to 57340 SMANHAT3 115 CKT 1	68	191.5	191.6	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 1	68	153.1	153.3	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	57335 MCDOWEL3 115 to 57340 SMANHAT3 115 CKT 2	92	167.2	167.4	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57340 SMANHAT3 115 to 57335 MCDOWEL3 115 CKT 2	92	133.7	133.9	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	ENTR	AEPW	99389 4MURFRE 138 to 53321 SNASHVL4 138 CKT 1	118	102.0	102.1	99397 3BISMURK 115 to 99403 3HSEHVW 115 CKT 1	0	Limits Renewal Rights	
10SP	AEPW	AEPW	53321 SNASHVL4 138 to 53306 PATTERS4 138 CKT	118	122.4	122.5	99397 3BISMURK 115 to 99403 3HSEHVW 115 CKT 1	0	Limits Rollover Rights	
10SP	AEPW	AEPW	54125 HEADRIK2 69 to 54138 SNYDER-2 69 CKT 1	53	113.9	114.5	54126 HOB-JCT4 138 to 54158 TAMARTP4 138 CKT	0	Limits Renewal Rights and May be a problem in the 06SP	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 1	68	194.5	194.7	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57339 S ALMA 3 115 to 57340 SMANHAT3 115 CKT 1	68	155.7	155.8	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the JEC-East Manhattan 230kV Line	
10SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 2	92	170.0	170.1	56861 EMANHAT6 230 to 57326 EMANHAT3 115 to 56888 EMANHAT118.0 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 633 Outage of the East Manhattan 230-115kV Transformer	
10SP	WERE	WERE	57340 SMANHAT3 115 to 57339 S ALMA 3 115 CKT 2	92	136.0	136.1	56852 JEC 6 230 to 56861 EMANHAT6 230 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 900 Outage of the East Manhattan 230-115kV Transformer	
10SP	EMDE	EMDE	59480 MON383 5 161 WND 1 MONETT 1	150	102.5	102.6	59468 AUR124 5 161 to 59480 MON383 5 161 CKT 1	0	Limits Renewal Rights	
10SP	GRDA	GRDA	54427 COLINS 5 161 to 54476 COLNSGR2 69 CKT 1	50	99.8	100.3	54427 COLINS 5 161 to 54476 COLNSGR2 69 CKT 2	483	Limits Renewal Rights	
10SP	ENTR	AEPW	99832 SOSAGE # 161 to 53136 EUREKA 5 161 CKT 1	223	99.8	100.0	99811 5HARR-E 161 to 99837 5SUMMIT 161 CKT 1	1195	Limits Renewal Rights	
10SP	AEPW	AEPW	53806 BCIRCLE2 69 to 53811 CATOOSA2 69 CKT 1	72	110.1	110.4	53782 LLAN WT4 138 to 53816 LLANETP4 138 CKT 1	1200	Invalid Contingency	
10SP	AEPW	AEPW	54024 MCALEST2 69 to 54029 WELEETK2 69 CKT 1	52	141.6	141.7	54022 LONEOAK4 138 to 54032 SMCALTP4 138 CKT 1	1200	Invalid Contingency	
10WP	WERE	WERE	57244 JARBALO3 115 to 57233 166TH 3 115 CKT 1	97	103.1	103.2	57252 MIDLAND3 115 to 57261 PENTAGN3 115 CKT 1	0	Limits Rollover Rights	
10WP	WERE	WERE	57321 ANZIO 3 115 to 57328 FT JCT 3 115 CKT 1	92	101.5	101.6	Multiple Outage Contingency: 57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 1 57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 2	0	May be relieved due to Westar Transmission Operating Directive 1217 Outage of the Fort JCT-West JCT City 115kV Line	
10WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	120.0	120.9	53154 CHAMSPR5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
10WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	110.7	111.2	53139 FLINTCR5 161 to 53170 TONTITN5 161 CKT 1	0	See Previous Upgrade Specified	
10WP	AEPW	AEPW	53170 TONTITN5 161 to 53154 CHAMSPR5 161 CKT 1	275	106.2	107.0	53157 SFAYTVL5 161 to 53195 FARMGTN5 161 CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	57165 HTI JCT3 115 to 57152 CIRCLVL3 115 CKT 1	97	114.1	114.4	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	WERE	WERE	57152 CIRCLVL3 115 to 57331 KING HL3 115 CKT 1	92	107.8	108.0	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	WERE	WERE	57301 EAST ST3 115 to 57309 WEMPOR3 115 CKT 1	92	107.2	107.4	56863 MORRIS 6 230 to 57305 MORRIS 3 115 to 56890 MORRIS 113.8 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 625 Outage of the Morris 230/115kV Transformer	
10WP	WERE	WERE	57331 KING HL3 115 to 57217 KELLY 3 115 CKT 1	92	105.6	105.8	56765 HOYT 7 345 to 56772 STRANGR7 345 CKT 1	0	May be relieved due to Westar Transmission Operating Directive 803 Outage of the Hoyt to Stranger 345 kV line	
10WP	SWPA	SWPA	52650 NORFORK269.0 WND 1 NFK X2 1	25	100.3	100.9	52648 NORFORK5 161 to 52650 NORFORK269.0 to 52649 NFK X1 113.8 CKT	0	See Previous Upgrade Specified	
10WP	WERE	WERE	57372 PHILIPS3 115 to 57374 SPHILPJ3 115 CKT 1	160	124.5	124.7	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCIPHER3 115 CKT 1	68	134.4	134.7	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	57374 SPHILPJ3 115 to 57438 WMCIPHER3 115 CKT 2	92	117.3	117.5	56872 EMCIPHER6 230 to 56873 SUMMIT 6 230 CKT 1	0	See Previous Upgrade Specified	
10WP	WERE	WERE	57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 1	68	105.4	105.5	57328 FT JCT 3 115 to 57343 WJCCTYE3 115 CKT 2	1200	Invalid Contingency	
									Total Estimated Cost	\$ 43,722,400

SPP-2003-271-1
 Table 3a - Modeling Representation for Table 3
 Includes Bus Numbers and Bus Names

Southwest Power Pool
 System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT	36	128.1	134.3	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT	0	Solution Undetermined	
04G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT	191	61.3	105.9	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT	849	Solution Undetermined	
04G	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT	287	51.8	101.8	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1096	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	23.9	105.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1119	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	23.8	104.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1122	Solution Undetermined	
04G	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	68.8	100.2	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	1165	Solution Undetermined	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	89.4	108.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	448	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	89.4	108.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	448	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	87.0	104.6	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	561	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	87.0	104.6	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	561	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	61.2	120.4	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	641	Solution Undetermined	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	75.9	118.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	693	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.2	115.3	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT	725	Solution Undetermined	
04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	79.5	108.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	734	Solution Undetermined	
04SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	78.1	105.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	820	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	72.1	107.6	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	833	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.2	112.5	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	854	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	71.3	106.8	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT	857	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.5	108.8	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT	871	Solution Undetermined	
04SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	72.3	105.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	897	Solution Undetermined	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	61.5	105.6	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	903	Solution Undetermined	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	60.1	104.2	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT	926	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	47.1	106.1	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT	932	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	50.3	108.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 1	934	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.8	111.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	944	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	49.1	105.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT	1001	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	49.5	104.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 1	1018	Solution Undetermined	
04SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	74.9	102.3	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT	1046	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.4	101.4	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT	1062	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	20.9	108.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1076	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	20.9	108.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1079	Solution Undetermined	
04SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	20.0	102.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1116	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	48.2	102.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT	1121	Solution Undetermined	
04SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	8.1	101.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1174	Solution Undetermined	
04SP	OKGE	OKGE	55190 AOCPT 2 69 to 55191 LULA 2 69 CKT	48	116.6	116.7	55181 VALYVUT2 69 to 55182 VALYVU2 69 CKT	1200	Invalid Contingency	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	24.5	111.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1042	Solution Undetermined	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	24.4	111.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1045	Solution Undetermined	
04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	70.4	101.5	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	1123	Solution Undetermined	
04SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	40.7	101.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1164	Solution Undetermined	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	51.6	100.5	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1185	Solution Undetermined	
04FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT	36	131.9	138.6	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT	0	Solution Undetermined	
04FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKTP269.0 CKT 1	48	101.7	102.5	54730 SO4TH2 269.0 to 54731 SO4TH4 4 138 to 55758 SO4TH 1113.2 CKT	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	98.5	101.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	755	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	15.9	102.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1167	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	15.9	102.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1170	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT	191	61.4	106.9	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT	1045	Solution Undetermined	
04WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	17.5	104.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1141	Solution Undetermined	
04WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	17.5	104.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1144	Solution Undetermined	
05G	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT	36	121.5	130.0	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT	0	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	25.6	111.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1017	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	25.6	111.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1021	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT	191	38.4	104.0	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT	1071	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	14.4	102.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1152	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	23.9	100.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1193	Solution Undetermined	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	95.2	116.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	202	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	95.2	116.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	202	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	92.6	112.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	313	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	92.6	112.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	313	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	82.8	129.9	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	553	Solution Undetermined	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	81.2	112.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	667	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	58.8	117.5	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	699	Solution Undetermined	
05SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	60.8	100.6	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	750	May be able to increase CTR (if relays will coordinate) at Shawnee sub.	\$ 5,000
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	79.6	108.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	753	Solution Undetermined	
05SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	92.9	99.8	55114 CHIGLEY4 138 to 55122 WYNNAP4 138 CKT1	773	At 800 MW the loading 100.3% and the facility is relieved by additional 200 MW. Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	78.2	114.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	786	Solution Undetermined	
05SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 1 PAOLI 1 1	50	92.7	99.6	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT1	786	At 800 MW the loading 100.2% and the facility is relieved by additional 200 MW. Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.5	112.0	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT	788	Solution Undetermined	
05SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	69.7	98.8	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	808	At 1000 MW the loading 102.4% and the facility is relieved by additional 200 MW. Solution Undetermined	
05SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	76.6	110.0	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	813	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	66.6	113.1	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	846	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	30.4	112.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	849	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	64.3	113.7	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT	853	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.2	110.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCAD2113.8 CKT 1	889	Solution Undetermined	
05SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	72.3	105.3	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT	895	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	52.7	110.6	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	915	Solution Undetermined	
05SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	70.3	103.0	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	935	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	68.6	104.7	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	936	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.5	111.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	942	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	58.5	105.1	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT	943	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	49.9	107.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCAD1113.8 CKT	948	Solution Undetermined	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	74.4	102.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT	949	Solution Undetermined	
05SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	69.2	101.8	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	957	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	64.6	102.7	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT	962	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	50.4	106.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCAD2113.8 CKT 1	963	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	66.2	102.2	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	963	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	56.1	100.5	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	999	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.1	103.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCAD1113.8 CKT	1047	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	43.9	102.1	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT	1068	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	18.3	106.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1109	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	18.2	106.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1112	Solution Undetermined	
05SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	18.6	102.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1118	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.1	100.0	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT	1197	Solution Undetermined	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	95.7	124.5	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	49.7	118.4	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	55235 PECANCK7 345 WND 2 PECANCK1 1	370	100.4	102.3	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT	0	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
05SH	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	94.7	116.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	105	Solution Undetermined	
05SH	OKGE	OKGE	55234 PECANCK5 161 WND 1 PECANCK1 1	370	99.2	101.0	55224 MUSKOGEE7 345 to 55302 FTSMITH7 345 CKT	296	See Previous Upgrade Specified	
05SH	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	84.6	101.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	720	Solution Undetermined	
05SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	76.7	108.5	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	769	Solution Undetermined	
05SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	72.3	104.0	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT	1005	Solution Undetermined	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	56.3	105.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1045	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	23.2	110.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1060	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	23.1	109.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1063	Solution Undetermined	
05SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	44.5	105.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1081	Solution Undetermined	
05FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT	36	122.3	128.8	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT	0	Solution Undetermined	
05FA	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	93.7	104.7	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT	266	Solution Undetermined	
05FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	13.5	100.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1194	Solution Undetermined	
05FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	13.5	100.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1197	Solution Undetermined	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	22.6	109.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1075	Solution Undetermined	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	22.6	108.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1078	Solution Undetermined	
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	97.0	123.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	133	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	97.0	123.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	133	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	94.1	117.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	261	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	94.1	117.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	261	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	95.6	104.2	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	460	Solution Undetermined	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	95.4	104.1	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT	483	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	81.6	135.5	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	571	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	83.2	117.3	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	600	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	94.1	102.6	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	637	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	93.9	102.5	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT	650	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	59.8	124.4	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	671	Solution Undetermined	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	81.5	113.3	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	684	Solution Undetermined	
07SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	62.3	111.4	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	700	See Previous Upgrade Specified	
07SP	OKGE	OKGE	55074 FRSTHIL2 69 to 55071 TECUMSH2 69 CKT 1	72	71.9	107.7	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	729	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	54.2	118.5	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1	762	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	77.9	117.3	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	807	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	78.2	120.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	817	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	29.3	117.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	828	Solution Undetermined	
07SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	98.3	102.1	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	852	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	52.0	114.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 1	853	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	66.3	120.5	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	872	Solution Undetermined	
07SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	287	86.7	104.3	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	879	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	63.8	120.9	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	882	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	76.2	107.6	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	889	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	73.3	112.2	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	893	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	50.7	111.6	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT	906	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	51.2	110.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 1	914	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.4	106.3	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	917	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	15.7	114.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	924	Solution Undetermined	
07SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	71.2	109.7	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	933	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	51.2	117.6	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	957	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	44.1	108.0	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	964	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	58.3	112.5	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	970	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	68.1	109.5	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	971	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.9	107.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT	975	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	67.0	108.9	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	979	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	65.2	109.3	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	983	Solution Undetermined	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	74.7	103.8	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	983	Solution Undetermined	
07SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	70.0	108.3	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1021	Solution Undetermined	
07SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	16.1	105.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1052	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	56.1	106.9	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	1065	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	48.0	104.0	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1070	Solution Undetermined	
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	75.5	105.5	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1074	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	60.7	104.5	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1090	Solution Undetermined	
07SP	OKGE	OKGE	54851 QUILCK4 138 to 54873 LONEOK4 138 CKT 1	308	67.2	102.6	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1094	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	68.2	102.6	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1104	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	61.2	103.2	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1121	Solution Undetermined	
07SP	OKGE	OKGE	54898 CIMARON4 138 to 54863 HAYMAKR4 138 CKT 1	308	73.1	101.5	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	1125	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54851 QUILCK4 138 to 54873 LONEOK4 138 CKT 1	308	66.5	101.8	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1126	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	16.7	105.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1128	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	16.6	105.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1131	Solution Undetermined	
07SP	OKGE	OKGE	54847 TULSA 4 138 to 54848 HEFNER 4 138 CKT 1	222	80.8	101.1	54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1	1144	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	3.2	102.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1149	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.9	100.5	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	1184	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	16.5	100.2	54933 DRAPER 4 138 to 54965 POSTTRD4 138 CKT 1	1192	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.8	100.2	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	1193	Solution Undetermined	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	19.9	107.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1099	Solution Undetermined	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	19.8	107.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1101	Solution Undetermined	
10SP	OKGE	AEPW	55261 BONANZT5 161 to 53126 BONANZAS 161 CKT 1	177	101.9	102.3	55262 AES 5 161 to 55264 TARBY 5 161 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	100.9	129.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	100.9	129.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	0	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	101.3	104.9	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	0	May Limit Renewal Rights and May be a problem in the 06SP	

Table 3a - Modeling Representation for Table 3
Includes Bus Numbers and Bus Names

Southwest Power Pool
System Impact Study

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	97.8	123.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	96	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	97.8	123.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	96	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	98.0	106.9	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	212	Solution Undetermined	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	97.8	106.7	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT	230	Solution Undetermined	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	96.3	105.0	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	373	Solution Undetermined	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	96.1	104.8	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT	390	Solution Undetermined	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	85.7	120.3	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	523	Solution Undetermined	
10SP	OKGE	OKGE	55235 PECANCK7 345 WND 2 PECANCK1 1	370	98.4	101.2	53756 CLARKSV7 345 to 55224 MUSKOGEE7 345 CKT 1	576	See Previous Upgrade Specified	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	83.9	116.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	607	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54881 MUSTANG4 138 CKT 1	287	78.1	133.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	684	Solution Undetermined	
10SP	OKGE	OKGE	54993 SE15TH 4 138 to 54965 POSTRDT4 138 CKT 1	191	58.1	115.4	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	704	May Limit Renewal Rights	
10SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	72.4	109.5	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	730	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.6	121.4	54833 DANFRTH4 138 to 55074 OMHAFER4 138 CKT 1	737	Solution Undetermined	
10SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	59.6	110.4	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	771	See Previous Upgrade Specified	
10SP	OKGE	OKGE	55055 MAUD 4 138 to 55044 SEMINOL4 138 CKT 2	287	80.6	104.1	55044 SEMINOL4 138 to 55055 MAUD 4 138 CKT 1	791	May Limit Renewal Rights	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	78.5	110.4	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	825	Solution Undetermined	
10SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	76.9	116.9	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	832	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	76.7	120.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	837	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	59.8	107.9	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	839	May Limit Renewal Rights	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	53.0	116.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 1	841	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	28.1	117.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	863	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	50.0	114.4	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1	863	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	51.7	113.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	892	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	52.1	111.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 1	900	Solution Undetermined	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	76.9	106.4	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	923	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	81.8	104.5	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	924	May Limit Renewal Rights	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	62.9	118.6	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	925	Solution Undetermined	
10SP	OKGE	OKGE	55235 PECANCK7 345 WND 2 PECANCK1 1	370	96.9	100.6	55224 MUSKOGEE7 345 to 55032 FTSMITH7 345 CKT 1	937	See Previous Upgrade Specified	
10SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	72.0	111.5	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	938	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	59.9	118.6	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	941	Solution Undetermined	
10SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	287	86.2	103.4	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	951	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	50.8	109.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	958	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	12.6	112.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	969	Solution Undetermined	
10SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	69.7	108.9	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	989	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	55.3	104.1	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	1000	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	63.4	108.7	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1038	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	65.9	108.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1038	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	46.1	114.5	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	1038	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	65.5	108.6	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1046	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	54.2	109.8	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1059	Solution Undetermined	
10SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	12.9	103.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1111	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	53.5	105.8	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	1119	Solution Undetermined	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	66.7	102.3	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1122	Solution Undetermined	
10SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	308	73.1	102.0	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	1135	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	68.5	107.4	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1144	Solution Undetermined	
10SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	67.0	102.0	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1144	Solution Undetermined	
10SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	58.2	102.8	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1147	Solution Undetermined	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	65.9	101.5	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1149	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	37.8	101.8	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	1149	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.3	102.3	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1159	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	44.7	101.1	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1171	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	12.5	101.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1184	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	12.4	101.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1187	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	16.3	100.1	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	1196	Solution Undetermined	
10SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	82.1	100.0	55059 SQUIRCK4 138 to 55060 INGLEWD4 138 CKT 1	1199	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	85.0	170.6	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	124.6	164.1	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	67.2	101.3	54933 DRAPER 4 138 to 54961 GM 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	69.0	100.6	54933 DRAPER 4 138 to 54946 MIDWEST4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10WP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	72.1	104.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	585	Solution Undetermined	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	19.7	104.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1132	Solution Undetermined	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	19.6	104.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1135	Solution Undetermined	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.1	102.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1138	Solution Undetermined	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	41.4	101.2	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1165	Solution Undetermined	
Total Cost										\$ 3,005,000

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	61.5	106.1	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	880	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	32.5	113.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	968	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	32.4	113.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	971	Solution Undetermined	
04G	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	287	50.4	100.9	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1148	Solution Undetermined	
04SP	OKGE	OKGE	55305 FTSMITH8 500 WND 2 FTSMITH3 1	480	101.8	102.4	55300 FTSMITH5 161 to 55302 FTSMITH7 345 to 55728 FTSMIT3113.8 CKT 1	0	OKGE Plans to Install 2nd 500-161kV transformer bank by 12/1/2004	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	88.3	107.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	489	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	88.3	107.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	489	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	85.9	103.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	602	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	85.9	103.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	602	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	59.7	119.6	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	658	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	54.7	114.5	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	742	Solution Undetermined	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	69.8	112.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	806	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	30.1	112.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	862	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	21.0	114.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	890	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	69.1	105.2	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	907	Solution Undetermined	
04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	74.7	103.5	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	909	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	51.2	107.1	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	913	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	68.3	104.4	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	930	Solution Undetermined	
04SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	78.3	106.1	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	942	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	45.6	105.1	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	959	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	28.7	117.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	964	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	48.3	106.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	966	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	28.6	116.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	967	Solution Undetermined	
04SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	67.8	101.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	983	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	22.8	105.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1011	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	14.4	107.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1018	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	47.1	104.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1047	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	47.5	103.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	1075	Solution Undetermined	
04SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	73.5	100.8	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	1078	Solution Undetermined	
04SP	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	287	48.7	101.8	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1148	Solution Undetermined	
04SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	51.5	100.6	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1165	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	46.3	100.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1179	Solution Undetermined	
04SP	OKGE	OKGE	55190 AOCPT 2 69 to 55191 LULA 2 69 CKT 1	48	116.4	116.5	55181 VALYVUT2 69 to 55182 VALLYVU2 69 CKT 1	1200	Invalid Contingency	
04SH	OKGE	OKGE	54730 SO4TH2 2 69 to 54732 CLEVETP2 69 CKT 1	92	102.8	106.3	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	32.2	119.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	934	Solution Undetermined	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	32.1	118.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	937	Solution Undetermined	
04SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	43.1	104.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1100	Solution Undetermined	
04SH	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	68.8	100.3	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	1184	Solution Undetermined	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	40.7	100.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1191	Solution Undetermined	
04FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	164.5	171.3	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKTP269.0 CKT 1	48	109.2	110.0	54730 SO4TH2 269.0 to 54731 SO4TH4 4 138 to 55758 SO4TH 1113.2 CKT 1	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	54732 NE ENID2 69 to 54725 HEMLKTP2 69 CKT 1	48	100.4	102.0	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	23.5	110.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1062	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	23.4	109.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1065	Solution Undetermined	
04FA	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	69.7	101.7	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1132	Solution Undetermined	
04FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	49.9	100.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1194	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	63.7	110.1	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	965	Solution Undetermined	
04WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	25.3	112.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1024	Solution Undetermined	
04WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	25.3	112.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1027	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	60.8	103.5	54834 KETCH 4 138 to 56173 OMFARF4 138 CKT 1	1123	Solution Undetermined	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	36.6	102.9	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1147	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	53.0	102.0	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	1157	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	52.5	101.7	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	1164	Solution Undetermined	
05AP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	30.9	107.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1093	Solution Undetermined	
05AP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	30.9	107.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1096	Solution Undetermined	
05G	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	169.0	178.1	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	33.4	120.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	905	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	33.3	119.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	907	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	41.6	107.5	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	982	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	15.2	106.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1073	Solution Undetermined	
05G	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	13.7	104.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1092	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	44.0	101.2	54834 KETCH 4 138 to 56173 OMFAIRF4 138 CKT 1	1164	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	22.1	100.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1182	Solution Undetermined	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	94.5	116.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	232	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	94.5	116.5	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	232	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	91.9	111.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	342	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	91.9	111.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	342	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	75.9	123.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	694	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.5	116.8	54833 DANFRTH4 138 to 56174 OMHAIFER4 138 CKT 1	713	Solution Undetermined	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	77.1	108.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	796	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	52.2	111.3	54832 EASTERN4 138 to 56174 OMHAIFER4 138 CKT 1	804	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	29.7	112.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	852	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	73.0	110.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	862	Solution Undetermined	
05SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	68.5	98.1	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	871	At 1000 MW the loading 101.7% and the facility is relieved by additional 200 MW. Solution Undetermined	
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	75.7	105.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	879	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	20.2	114.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	887	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	49.4	109.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	913	Solution Undetermined	
05SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	69.8	103.7	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	927	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	56.7	106.6	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	930	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	58.1	105.1	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	937	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	46.5	104.8	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	964	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	48.2	106.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	971	Solution Undetermined	
05SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	26.5	115.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	989	Solution Undetermined	
05SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	26.5	115.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	991	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	48.6	105.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	993	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	21.6	105.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	995	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	12.6	106.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1021	Solution Undetermined	
05SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	75.8	102.8	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1022	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	47.4	102.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	1099	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	42.6	101.3	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	1117	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	40.3	100.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1178	Solution Undetermined	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	93.6	122.8	54986 GLENDEL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	42.1	111.6	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	88.1	109.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	243	Solution Undetermined	
05SH	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	75.5	107.7	54833 DANFRTH4 138 to 56174 OMHAIFER4 138 CKT 1	823	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	31.4	118.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	942	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	31.3	118.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	944	Solution Undetermined	
05SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	47.4	109.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1011	Solution Undetermined	
05SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	55.8	105.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1045	Solution Undetermined	
05SH	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	71.1	103.2	54832 EASTERN4 138 to 56174 OMHAIFER4 138 CKT 1	1047	Solution Undetermined	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	44.7	104.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1096	Solution Undetermined	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	52.8	101.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1149	Solution Undetermined	
05FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	166.1	172.6	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
05FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKT269.0 CKT 1	48	108.0	108.9	54730 SO4TH2 269.0 to 54731 SO4TH4 4 138 to 55758 SO4TH 1113.2 CKT 1	0	Possible Invalid Contingency	
05FA	OKGE	OKGE	54732 NE ENID2 69 to 54725 HEMLKT2 69 CKT 1	48	99.2	101.0	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	510	Solution Undetermined	
05FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	21.8	108.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1077	Solution Undetermined	
05FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	21.8	108.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1080	Solution Undetermined	
05FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	28.3	100.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1196	Solution Undetermined	
05WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	30.5	117.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	960	Solution Undetermined	
05WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	30.5	117.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	963	Solution Undetermined	
05WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	51.4	103.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1130	Solution Undetermined	
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	96.0	122.2	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	179	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	96.0	122.2	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	179	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	93.2	117.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	303	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	93.2	117.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	303	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	93.9	102.8	55114 CHIGLEY4 138 to 55122 WYNNTP4 138 CKT 1	656	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	93.7	102.6	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	671	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	58.9	123.9	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	681	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	79.2	113.5	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	728	Solution Undetermined	
07SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	60.5	109.9	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	734	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	75.0	129.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	737	Solution Undetermined	
07SP	OKGE	OKGE	55074 FRSTHIL2 69 to 55071 TECUMSH2 69 CKT 1	72	70.6	106.8	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	759	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.3	118.0	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	773	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	92.3	101.0	55114 CHIGLEY4 138 to 55122 WYNNTP4 138 CKT 1	796	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	98.5	102.5	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	803	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	77.8	109.8	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	810	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	92.2	100.9	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	821	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	28.8	117.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	834	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	18.5	117.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	878	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	50.1	113.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	879	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	40.4	103.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	879	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	73.4	115.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	881	Solution Undetermined	
07SP	OKGE	OKGE	55073 ERLSBOR2 69 to 55074 FRSTHIL2 69 CKT 1	48	47.1	104.0	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	906	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	71.3	111.1	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	915	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	48.9	110.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	930	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	49.4	109.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	946	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	56.5	114.0	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	954	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	58.1	112.7	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	958	Solution Undetermined	
07SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	287	85.0	102.9	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	969	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	19.5	109.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	969	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	43.1	107.5	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	974	Solution Undetermined	
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	79.3	109.7	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	979	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	72.6	104.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	993	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	9.7	109.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1003	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	66.6	105.9	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1005	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	45.4	112.0	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	1006	Solution Undetermined	
07SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	25.0	114.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1009	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	48.1	106.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1009	Solution Undetermined	
07SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	25.0	114.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1012	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.8	103.1	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	1033	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	52.2	106.8	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1057	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	63.2	104.9	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1069	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	64.5	103.4	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	1085	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.9	104.3	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1093	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	61.0	103.2	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1113	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	46.1	102.4	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1120	Solution Undetermined	
07SP	OKGE	OKGE	54863 HAYMAKR4 138 to 54853 DIVISION4 138 CKT 1	287	63.3	102.0	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1131	Solution Undetermined	
07SP	OKGE	OKGE	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	287	48.6	101.9	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1140	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	51.8	102.9	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	1142	Solution Undetermined	
07SP	OKGE	OKGE	54847 TULSA 4 138 to 54848 HEFNER 4 138 CKT 1	222	80.2	100.9	54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1	1155	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	71.3	100.6	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1165	Solution Undetermined	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	64.6	100.2	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1190	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	40.0	100.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1193	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	60.2	104.2	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1196	Solution Undetermined	
07WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	27.9	115.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	963	Solution Undetermined	
07WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	27.9	115.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	980	Solution Undetermined	
07WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	14.9	103.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1126	Solution Undetermined	
10SP	OKGE	OKGE	55256 MULDRON2 69 to 55307 3RDST 2 69 CKT 1	48	102.3	102.7	55335 KILGORE2 69 to 55336 VBI 2 69 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	SWPA	55157 BROWN 4 138 to 52802 S BROWN4 138 CKT 1	120	100.0	101.7	55120 RUSSET-4 138 to 55147 GLASSES4 138 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	55345 COLONY 5 161 to 55300 FTSMITH5 161 CKT 1	335	102.2	102.5	55300 FTSMITH5 161 to 55310 QUANXTP5 161 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	55343 MASSARD5 161 WND 2 MASSARD4 1	120	103.7	104.0	55300 FTSMITH5 161 to 55306 ARKOMA 5 161 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	55342 MASSARD269.0 WND 1 MASSARD4 1	120	101.2	101.4	55300 FTSMITH5 161 to 55306 ARKOMA 5 161 CKT 1	0	May Limit Renewal Rights	

Table 4a - Modeling Representation for Table 4
Includes Bus Numbers and Bus Names

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	55343 MASSARD5 161 WND 2 MASSARD4 1	120	100.1	100.4	55306 ARKOMA 5 161 to 55308 3RDST 5 161 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	101.3	105.1	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	99.5	128.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	20	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	99.5	128.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	20	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	96.5	122.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	153	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	96.5	122.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	153	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	96.2	105.2	55114 CHIGLEY4 138 to 55122 WYNNTP4 138 CKT 1	403	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	96.0	105.1	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	422	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	94.4	103.3	55114 CHIGLEY4 138 to 55122 WYNNTP4 138 CKT 1	582	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	94.3	103.1	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	601	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54880 NORTHWT7 345 WND 2 NORTHWT2 1	493	82.0	116.8	54879 NORTHWT4 138 to 54880 NORTHWT7 345 to 55743 NORTHWS2113.8 CKT 2	646	Solution Undetermined	
10SP	OKGE	OKGE	54879 NORTHWT4 138 WND 1 NORTHWT2 1	493	80.3	112.7	54879 NORTHWT4 138 to 54880 NORTHWT7 345 to 55743 NORTHWS2113.8 CKT 2	735	Solution Undetermined	
10SP	OKGE	OKGE	54833 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	55.6	120.5	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	754	Solution Undetermined	
10SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	70.7	108.1	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	777	Solution Undetermined	
10SP	OKGE	OKGE	54993 SE15TH 4 138 to 54965 POSTRDT4 138 CKT 1	191	52.5	110.6	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	813	May Limit Renewal Rights	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	70.9	126.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	823	Solution Undetermined	
10SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	57.1	108.3	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	826	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.4	114.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	868	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	27.3	117.1	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	872	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	48.9	113.6	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	880	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	50.1	112.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	919	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	15.3	115.7	54880 NORTHWT7 345 to 54908 ARCADIA7 345 CKT 1	926	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	71.4	115.0	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	929	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	50.5	110.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	932	Solution Undetermined	
10SP	OKGE	OKGE	54880 NORTHWT7 345 WND 2 NORTHWT3 2	493	75.1	107.2	54879 NORTHWT4 138 to 54880 NORTHWT7 345 to 55742 NORTHWS1113.8 CKT 1	932	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	55.2	104.0	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	940	May Limit Renewal Rights	
10SP	OKGE	OKGE	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	287	39.8	108.5	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	964	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	80.4	103.3	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	970	May Limit Renewal Rights	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	69.8	110.2	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	973	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.2	107.6	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	989	Solution Undetermined	
10SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	16.2	107.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1029	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	52.1	111.2	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1043	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	54.1	110.3	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1047	Solution Undetermined	
10SP	OKGE	OKGE	54879 NORTHWT4 138 WND 1 NORTHWT3 2	493	73.5	103.3	54879 NORTHWT4 138 to 54880 NORTHWT7 345 to 55742 NORTHWS1113.8 CKT 1	1049	Solution Undetermined	
10SP	OKGE	OKGE	55073 ERLSBOR2 69 to 55074 FRSTHIL2 69 CKT 1	48	43.0	101.8	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	1055	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	21.4	110.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1061	Solution Undetermined	
10SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	21.4	110.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1064	Solution Undetermined	
10SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	287	84.5	101.8	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1069	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	64.9	104.8	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1090	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	4.6	105.5	54880 NORTHWT7 345 to 54908 ARCADIA7 345 CKT 1	1091	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	39.9	103.5	54880 NORTHWT7 345 to 54908 ARCADIA7 345 CKT 1	1124	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	60.6	103.5	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1135	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	57.8	103.2	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1143	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	47.6	103.7	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1147	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	62.6	102.2	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	1150	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.1	102.5	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1154	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	57.5	102.2	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1158	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	51.7	100.6	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	1170	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	36.8	101.0	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	1173	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	48.9	101.4	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1180	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	61.4	100.7	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1183	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	39.5	100.2	54880 NORTHWT7 345 to 54908 ARCADIA7 345 CKT 1	1194	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	44.0	100.1	54879 NORTHWT4 138 to 54880 NORTHWT7 345 to 55742 NORTHWS1113.8 CKT 1	1198	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	75.8	162.6	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	121.7	161.6	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	27.8	113.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1019	Solution Undetermined	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	27.7	112.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1022	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	33.5	105.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1070	Solution Undetermined	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	40.5	100.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1172	Solution Undetermined	
									Total Cost	\$ -

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04G	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	155.3	162.4	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04G	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	287	64.0	114.7	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	742	Solution Undetermined	
04G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	66.5	111.4	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	748	Solution Undetermined	
04G	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	71.6	103.3	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	914	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	35.7	116.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	917	Solution Undetermined	
04G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	35.6	116.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	920	Solution Undetermined	
04G	OKGE	OKGE	54907 ARCADIA4 138 to 54941 HSL 4 138 CKT 1	287	42.4	102.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1139	Solution Undetermined	
04G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	57.9	100.9	54834 KETCH 4 138 to 56173 OMFAIRF4 138 CKT 1	1146	Solution Undetermined	
04G	OKGE	OKGE	54907 ARCADIA4 138 to 54941 HSL 4 138 CKT 1	287	53.0	100.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1175	Solution Undetermined	
04G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	53.0	100.4	54907 ARCADIA4 138 to 54941 HSL 4 138 CKT 1	1180	Solution Undetermined	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	87.6	107.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	513	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	87.6	107.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	513	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	64.5	124.1	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	582	Solution Undetermined	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	85.3	103.2	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	628	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	85.3	103.2	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	628	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	59.5	119.0	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	666	Solution Undetermined	
04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	80.1	108.8	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	711	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	74.3	110.2	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	763	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.4	113.0	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	779	Solution Undetermined	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	73.5	109.4	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	784	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	34.2	116.0	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	785	Solution Undetermined	
04SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	78.7	105.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	791	Solution Undetermined	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	70.1	112.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	802	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	50.4	109.7	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	832	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	23.7	116.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	842	Solution Undetermined	
04SP	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	287	61.9	115.0	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	879	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.6	109.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	889	Solution Undetermined	
04SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	81.2	108.8	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	889	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	32.1	120.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	922	Solution Undetermined	
04SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	32.0	119.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	925	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	25.9	108.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	938	Solution Undetermined	
04SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	58.1	107.0	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	939	Solution Undetermined	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	50.3	107.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	956	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	50.7	106.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	971	Solution Undetermined	
04SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	68.0	101.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	980	Solution Undetermined	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	16.1	109.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	981	Solution Undetermined	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.6	102.0	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	1009	Solution Undetermined	
04SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	65.3	102.5	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1053	Solution Undetermined	
04SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	58.6	102.2	54850 SKYLINE4 138 to 54851 QUAILCK4 138 CKT 1	1058	Solution Undetermined	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.4	103.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	1064	Solution Undetermined	
04SP	OKGE	OKGE	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	287	52.4	101.5	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1114	Solution Undetermined	
04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	73.7	100.3	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1151	Solution Undetermined	
04SP	OKGE	OKGE	55190 AOCP2 2 69 to 55191 LULA 2 69 CKT 1	48	116.6	116.7	55181 VALYVUT2 69 to 55182 VALLYVU2 69 CKT 1	1200	Invalid Contingency	
04SH	OKGE	OKGE	54730 SO4TH2 2 69 to 54722 CLEVETP2 69 CKT 1	92	104.2	107.7	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	35.5	122.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	890	Solution Undetermined	
04SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	35.4	122.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	893	Solution Undetermined	
04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	73.4	104.7	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	947	Solution Undetermined	
04SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	45.7	106.9	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1041	Solution Undetermined	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	54.7	104.0	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1081	Solution Undetermined	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	42.3	102.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1150	Solution Undetermined	
04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	69.2	100.6	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	1169	Solution Undetermined	
04FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	166.2	173.2	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKTP269.0 CKT 1	48	108.9	109.7	54730 SO4TH2 269.0 to 54731 SO4TH4 4 138 to 55758 SO4TH 1113.2 CKT 1	0	Possible Invalid Contingency	
04FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKTP269.0 CKT 1	48	100.2	101.9	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
04FA	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	73.7	105.6	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	977	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	27.0	113.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1013	Solution Undetermined	
04FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	26.9	113.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1016	Solution Undetermined	
04FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	52.3	102.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1128	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	67.8	113.6	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	837	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
04WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	29.4	116.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	974	Solution Undetermined	
04WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	29.4	116.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	977	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	63.4	105.5	54834 KETCH 4 138 to 56173 OMFAIRF4 138 CKT 1	1076	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	56.4	104.7	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	1097	Solution Undetermined	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	39.4	105.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1102	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	55.6	104.2	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	1108	Solution Undetermined	
04WP	OKGE	OKGE	54835 MEMRIAL4 138 to 54832 EASTERN4 138 CKT 1	191	59.7	101.8	54850 SKYLINE4 138 to 56173 OMFAIRF4 138 CKT 1	1159	Solution Undetermined	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	47.8	101.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1161	Solution Undetermined	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	36.2	100.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1186	Solution Undetermined	
05AP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	35.1	111.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1039	Solution Undetermined	
05AP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	35.0	111.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1042	Solution Undetermined	
05G	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	170.1	179.3	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	37.4	123.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	853	Solution Undetermined	
05G	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	37.4	123.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	856	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	45.1	111.2	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	887	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.4	108.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1027	Solution Undetermined	
05G	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	16.0	106.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1059	Solution Undetermined	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	26.6	104.2	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1088	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	46.4	103.5	54834 KETCH 4 138 to 56173 OMFAIRF4 138 CKT 1	1099	Solution Undetermined	
05G	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	23.9	102.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1124	Solution Undetermined	
05G	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	48.5	101.6	54833 DANFRTH4 138 to 56174 OMHAIFER4 138 CKT 1	1129	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	33.2	101.7	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	1153	Solution Undetermined	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	33.7	101.3	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	1164	Solution Undetermined	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	93.8	115.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	258	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	93.8	115.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	258	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	91.3	111.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	368	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	91.3	111.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	368	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	82.7	113.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	615	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	61.8	120.8	54833 DANFRTH4 138 to 56174 OMHAIFER4 138 CKT 1	645	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	76.3	123.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	688	Solution Undetermined	
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	81.1	110.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	697	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.5	115.3	54832 EASTERN4 138 to 56174 OMHAIFER4 138 CKT 1	734	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	33.7	116.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	784	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	23.0	116.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	841	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	52.9	112.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	842	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	73.3	110.2	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	860	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	51.6	109.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	900	Solution Undetermined	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	75.8	104.3	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	902	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	52.1	108.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA2113.8 CKT 2	916	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	56.5	106.3	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	932	Solution Undetermined	
05SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	24.7	108.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	933	Solution Undetermined	
05SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	69.1	102.9	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	941	Solution Undetermined	
05SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	30.2	118.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	945	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54852 SLVRLAK4 138 CKT 1	287	46.9	105.4	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	946	Solution Undetermined	
05SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	30.1	118.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	947	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	57.0	103.9	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	950	Solution Undetermined	
05SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	47.4	105.6	54853 DIVISION4 138 to 54861 MUSTANG4 138 CKT 1	958	Solution Undetermined	
05SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	78.5	105.2	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	966	Solution Undetermined	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	50.7	105.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA1113.8 CKT 1	983	Solution Undetermined	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	14.4	108.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	983	Solution Undetermined	
05SP	OKGE	OKGE	54853 DIVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	63.0	102.4	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	993	Solution Undetermined	
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	74.3	101.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1042	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	50.2	101.2	54852 SLVRLAK4 138 to 54853 DIVISION4 138 CKT 1	1106	Solution Undetermined	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	41.5	101.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1145	Solution Undetermined	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	63.7	100.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1149	Solution Undetermined	
05SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.1	100.2	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	1178	Solution Undetermined	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	90.4	119.6	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	38.0	107.3	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
05SH	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	88.2	109.9	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	239	Solution Undetermined	
05SH	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	79.7	111.7	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	589	Solution Undetermined	
05SH	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	75.3	107.2	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	844	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	35.1	122.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	894	Solution Undetermined	
05SH	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	35.1	121.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	896	Solution Undetermined	
05SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	59.8	109.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	942	Solution Undetermined	
05SH	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	50.1	111.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	954	Solution Undetermined	
05SH	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	84.3	101.5	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	1042	Solution Undetermined	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	46.5	106.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1060	Solution Undetermined	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	55.8	104.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1069	Solution Undetermined	
05SH	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	60.9	101.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	1139	Solution Undetermined	
05FA	OKGE	OKGE	54722 CLEVETP2 69 to 54721 IMO 2 69 CKT 1	36	169.1	175.9	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	0	Solution Undetermined	
05FA	OKGE	OKGE	54732 NE ENID269.0 to 54725 HEMLKTP269.0 CKT 1	48	107.7	108.7	54730 SO4TH2 269.0 to 54731 SO4TH4 4 138 to 55758 SO4TH 1113.2 CKT 1	0	Possible Invalid Contingency	
05FA	OKGE	OKGE	54732 NE ENID2 69 to 54725 HEMLKTP2 69 CKT 1	48	99.0	100.9	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	574	Solution Undetermined	
05FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	25.4	112.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1028	Solution Undetermined	
05FA	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	25.4	112.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1031	Solution Undetermined	
05FA	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	55.4	104.0	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1040	Solution Undetermined	
05FA	OKGE	OKGE	54730 SO4TH2 2 69 to 54722 CLEVETP2 69 CKT 1	92	97.6	100.3	54731 SO4TH4 4 138 to 54790 IMO TAP4 138 CKT 1	1048	Solution Undetermined	
05FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.3	103.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1117	Solution Undetermined	
05FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	40.0	100.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1190	Solution Undetermined	
05WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	34.5	121.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	908	Solution Undetermined	
05WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	34.5	120.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	911	Solution Undetermined	
05WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	54.3	105.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1075	Solution Undetermined	
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	96.8	123.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	142	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	96.8	123.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	142	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	94.0	117.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	268	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	94.0	117.8	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	268	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	84.5	118.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	554	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	62.4	127.2	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	627	Solution Undetermined	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	82.8	114.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	631	Solution Undetermined	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	93.8	102.6	55114 CHIGLEY4 138 to 55122 WYNNAP4 138 CKT 1	681	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	93.6	102.4	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	697	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.8	121.4	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	721	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	74.9	129.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	732	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	32.6	121.1	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	787	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	53.9	116.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	812	Solution Undetermined	
07SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	55.9	105.7	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	833	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	98.4	102.2	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	835	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	21.1	120.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	845	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	77.4	108.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	848	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	92.2	100.8	55114 CHIGLEY4 138 to 55122 WYNNAP4 138 CKT 1	852	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	52.5	113.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	864	Solution Undetermined	
07SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	67.5	103.8	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	868	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	53.0	112.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	872	Solution Undetermined	
07SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	92.0	100.6	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	877	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	73.3	115.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	881	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	46.7	110.8	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	909	Solution Undetermined	
07SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	287	86.1	103.9	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	913	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.1	106.2	54849 LAKESID4 138 to 54853 DIVISION4 138 CKT 1	928	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	51.6	109.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	931	Solution Undetermined	
07SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	21.9	111.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	931	Solution Undetermined	
07SP	OKGE	OKGE	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	70.4	110.1	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	933	Solution Undetermined	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	75.9	105.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	939	Solution Undetermined	
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	81.3	111.5	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	946	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	55.9	113.5	54853 DIVISION4 138 to 54863 HAYMAKR4 138 CKT 1	962	Solution Undetermined	
07SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	27.9	116.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	976	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	56.6	111.3	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	976	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
07SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	27.8	116.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	978	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	11.0	110.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	982	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	50.3	106.5	54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1	993	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	45.8	112.4	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1006	Solution Undetermined	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	63.5	107.3	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1021	Solution Undetermined	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOKA4 138 CKT 1	308	68.4	103.9	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1041	Solution Undetermined	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	65.7	105.0	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1042	Solution Undetermined	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOKA4 138 CKT 1	308	67.6	103.1	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1072	Solution Undetermined	
07SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	51.6	106.3	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1074	Solution Undetermined	
07SP	OKGE	OMPA	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	287	50.8	103.9	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1075	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	63.1	104.8	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1076	Solution Undetermined	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	42.0	105.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1081	Solution Undetermined	
07SP	OKGE	OKGE	54847 TULSA 4 138 to 54848 HEFNER 4 138 CKT 1	222	81.6	102.1	54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1	1097	May Limit Renewal Rights and May be a problem in the 06SP	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.4	103.8	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1108	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	20.2	102.9	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	1118	Solution Undetermined	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	63.6	102.5	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	1120	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	19.2	102.0	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	1137	Solution Undetermined	
07SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	52.4	101.1	54848 HEFNER 4 138 to 54849 LAKESID4 138 CKT 1	1138	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	52.1	103.2	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1139	Solution Undetermined	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.9	102.2	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1144	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.8	101.6	54933 DRAPER 4 138 to 54965 POSTRDT4 138 CKT 1	1147	Solution Undetermined	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	41.5	101.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1155	Solution Undetermined	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.9	101.5	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	1156	Solution Undetermined	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	62.3	101.1	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1164	Solution Undetermined	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	67.1	100.6	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1177	Solution Undetermined	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	52.3	100.8	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1180	Solution Undetermined	
07WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	31.9	119.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	930	Solution Undetermined	
07WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	31.8	119.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	933	Solution Undetermined	
07WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.1	105.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1066	Solution Undetermined	
10SP	OKGE	AEPW	55261 BONANZT5 161 to 53126 BONANZA5 161 CKT 1	177	101.6	101.9	55262 AES 5 161 to 55264 TARBY 5 161 CKT 1	0	May Limit Renewal Rights	
10SP	OKGE	OKGE	54980 SUNNYLN2 69 to 54972 RENO 2 69 CKT 1	96	101.3	105.1	54977 KENTUKT2 69 to 54978 SAGE 2 69 CKT 1	0	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	99.1	128.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	39	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	99.1	128.0	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	39	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	96.1	122.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	172	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	96.1	122.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	172	Add third 345 - 138 kV transformer at Draper in 2008 at OKGE expense and May be relieved by operating directive until 2008.	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	95.9	104.9	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	436	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	55100 PAOLI- 4 138 WND 2 PAOLI 1 1	50	95.7	104.7	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	455	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	87.1	121.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	474	Solution Undetermined	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	85.3	117.5	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	554	Solution Undetermined	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	94.1	102.9	55114 CHIGLEY4 138 to 55122 WYNNTPA4 138 CKT 1	625	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	55099 PAOLI 269.0 WND 1 PAOLI 1 1	50	94.0	102.7	55113 CHIGLEY269.0 to 55114 CHIGLEY4 138 to 55712 CHIGLEY113.2 CKT 1	645	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	59.7	124.7	54833 DANFRTH4 138 to 56174 OMHAFAER4 138 CKT 1	678	Solution Undetermined	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	79.8	111.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	780	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.0	117.7	54832 EASTERN4 138 to 56174 OMHAFAER4 138 CKT 1	799	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	54.6	118.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIE2113.8 CKT 2	803	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.5	121.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	808	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	71.5	127.4	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	814	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	53.3	115.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIE1113.8 CKT 1	853	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	53.7	113.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIE2113.8 CKT 2	862	Solution Undetermined	
10SP	OKGE	OKGE	54993 SE15TH 4 138 to 54965 POSTRDT4 138 CKT 1	191	50.0	108.4	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	863	May Limit Renewal Rights	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	78.2	107.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	876	Solution Undetermined	
10SP	OKGE	OKGE	55071 TECUMSH2 69 to 55074 FRSTHIL2 69 CKT 1	72	67.3	104.9	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	889	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	18.2	118.4	54880 NORTWST7 345 to 54907 ARCADIA7 345 CKT 1	890	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	52.4	110.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIE1113.8 CKT 1	919	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	71.9	115.5	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	921	Solution Undetermined	
10SP	OKGE	OKGE	55070 MISSION2 69 to 55068 SHAWNEE2 69 CKT 1	51	52.1	103.7	55059 SQUIRCK4 138 to 55075 FRSTHIL4 138 CKT 1	953	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	19.3	110.5	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	971	Solution Undetermined	
10SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	287	85.8	103.1	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	975	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	69.4	109.8	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	983	Solution Undetermined	

Study Case	From Area	To Area	Monitored Branch Over 100% Rate B	Rate <MVA>	BC % Loading	TC % Loading	Outaged Branch Causing Overload	ATC (MW)	Solution	Cost
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	53.2	102.1	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	986	May Limit Renewal Rights	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	55.3	104.2	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	996	Solution Undetermined	
10SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	24.7	113.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1018	Solution Undetermined	
10SP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	24.6	113.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1021	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	52.1	111.3	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1042	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	191	78.9	101.9	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1052	May Limit Renewal Rights	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	6.5	107.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1055	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	40.9	105.1	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	1057	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	53.2	109.5	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1059	Solution Undetermined	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	67.9	103.7	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1074	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54852 SLVRLAK4 138 CKT 1	287	61.2	105.9	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1090	Solution Undetermined	
10SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	47.4	103.9	54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1	1093	Solution Undetermined	
10SP	OKGE	OKGE	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	287	40.9	109.5	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1094	Solution Undetermined	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	69.2	103.0	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1094	Solution Undetermined	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	41.0	104.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1101	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	64.4	104.3	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1101	Solution Undetermined	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOK4 138 CKT 1	308	67.1	102.9	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1102	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54893 XEROX 4 138 CKT 1	382	61.1	104.0	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1126	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.5	102.3	54833 DANFRTH4 138 to 56174 OMHAFFER4 138 CKT 1	1138	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	57.8	103.3	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1142	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	47.6	103.7	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1148	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	17.6	101.5	55055 MAUD 4 138 to 55075 FRSTHIL4 138 CKT 1	1155	Solution Undetermined	
10SP	OKGE	OKGE	54847 TULSA 4 138 to 54848 HEFNER 4 138 CKT 1	222	81.0	101.0	54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1	1158	May Limit Renewal Rights and May be a problem in the 06SP	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	62.2	101.7	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	1160	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	58.5	101.9	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1165	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	40.6	101.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1170	Solution Undetermined	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	49.7	102.2	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1170	Solution Undetermined	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.0	100.7	54832 EASTERN4 138 to 56174 OMHAFFER4 138 CKT 1	1181	Solution Undetermined	
10SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	72.3	100.9	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1182	Solution Undetermined	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	68.2	100.4	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1185	Solution Undetermined	
10SP	OKGE	OKGE	54832 EASTERN4 138 to 56174 OMHAFFER4 138 CKT 1	287	47.0	100.4	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1190	Solution Undetermined	
10SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	44.6	100.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1190	Solution Undetermined	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	60.9	100.3	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1194	Solution Undetermined	
10SP	OKGE	OKGE	54907 ARCADIA4 138 to 54906 KAMOMEM4 138 CKT 1	287	15.8	100.1	54933 DRAPER 4 138 to 54965 POSTRDT4 138 CKT 1	1196	Solution Undetermined	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	71.7	158.8	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10SP	OKGE	OKGE	54990 TINKER24 138 to 54988 TINKER44 138 CKT 1	100	118.7	158.8	54986 GLENDAL4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%. No problem exist with line open.	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 2	1195	31.7	116.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	965	Solution Undetermined	
10WP	OKGE	OKGE	54909 REDBUD 7 345 to 54908 ARCADIA7 345 CKT 1	1195	31.6	116.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	968	Solution Undetermined	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	36.3	108.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1006	Solution Undetermined	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	44.5	104.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1057	Solution Undetermined	
10WP	OKGE	OKGE	54941 HSL 4 138 to 54906 KAMOMEM4 138 CKT 1	287	30.7	101.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1158	Solution Undetermined	
Total Cost									\$ -	